Journal of the Royal Society of Arts

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FORTHCOMING MEETINGS

WEDNESDAY, 1ST NOVEMBER, at **2.30 p.m.** INAUGURAL MEETING. '*The Shrinking World: What Next for Britain?*' by The Right Honble. Lord Nathan, P.C., T.D., F.B.A., Chairman of Council of the Society.

WEDNESDAY, 8TH NOVEMBER, at **2.30 p.m.** '*Vocational Training and Industrial Rehabilitation*', by G. H. Cullen, Manager, Ministry of Labour Government Training Centre and Industrial Rehabilitation Unit, Perivale. Sir Harold Emmerson, G.C.B., K.C.V.O., formerly Permanent Secretary, Ministry of Labour, in the Chair. (The paper will be illustrated by a film.)

THURSDAY, 9TH NOVEMBER, at **5.15 p.m.** COMMONWEALTH SECTION. '*New Developments in the Use of Solar Energy*', by Harold Heywood, B.Sc., Ph.D., M.I.Mech.E., M.I.Chem.E., Principal, The Woolwich Polytechnic, and a Member of Council of the Association for Applied Solar Energy, U.S.A. Sir Philip Southwell, C.B.E., M.C., a Director, Kuwait Oil Co. Ltd., and a Member of Council of the Society, in the Chair. (The paper will be illustrated by lantern slides in colour. Tea will be served in the Library from 4.30 p.m.)

WEDNESDAY, 15TH NOVEMBER, at **6 p.m.** '*Engineering and Architecture*', by Professor Ing. Riccardo Morandi. Sir Herbert Manzoni, C.B.E., City Engineer & Surveyor, Birmingham, and President, Institution of Civil Engineers, in the Chair. (The paper will be illustrated by lantern slides.)

MONDAY, 20TH NOVEMBER, at **6 p.m.** The first of three CANTOR LECTURES on '*Some Problems of British Export Trade*', entitled '*Exports and the Country's Economy*', by J. L. S. Steel, M.A., J.P., Chairman, Overseas Trade Policy Committee, Federation of British Industries. Sir Ernest Goodale, C.B.E., M.C., Chairman, Furnishing Fabrics Export Group, and a Vice-President of the Society, in the Chair.

WEDNESDAY, 22ND NOVEMBER, at **2.30 p.m.** INAUGURAL 'REFLECTION RIDING' LECTURE. '*Landscape and Civilization*', by Miss Sylvia Crowe, a Past-President of the Institute of Landscape Architects. Robert N. Chambliss, LL.B., in the Chair.

MONDAY, 27TH NOVEMBER, at **6 p.m.** The second of three CANTOR LECTURES on '*Some Problems of British Export Trade*', entitled '*Production for Export*', by Reay M. Geddes, O.B.E., Managing Director, Dunlop Rubber Company Ltd. The Honble. G. C. H. Chubb, M.A., Managing Director, Chubb & Sons Lock & Safe Co. Ltd., and a Member of Council of the Society, in the Chair.

WEDNESDAY, 29TH NOVEMBER, at **6 p.m.** '*Television in Schools*', by Paul Adorian, F.C.G.I., M.I.E.E., M.Brit.I.R.E., Managing Director, Associated Rediffusion Ltd. Sir John Wolfenden, C.B.E., Vice-Chancellor, Reading University, in the Chair. (The paper will be illustrated by lantern slides.)

FRIDAY, 1ST DECEMBER, at **7.30 p.m.** Film Evening. (See programme on p. 909.)

MONDAY, 4TH DECEMBER, at **6 p.m.** The last of three CANTOR LECTURES on '*Some Problems of British Export Trade*', entitled '*Overseas Marketing*', by Roger Falk, O.B.E., Chairman, Marketing Development Co. Ltd. Sir Walter Worboys, Chairman, B.T.R. Industries Ltd., and a Member of Council of the Society, in the Chair.

TUESDAY, 5TH DECEMBER, at **2.30 p.m.** COMMONWEALTH SECTION. '*The Design and Manufacture of Postage Stamps in the Commonwealth*', by John Easton, Chairman and Managing Director, Robert MacLehose & Co. Ltd. Sir John Wilson, Bt., K.C.V.O., Keeper of The Queen's Philatelic Collection, in the Chair. (The paper has been arranged particularly for younger people (aged 15-18), on whose behalf Fellows are invited to apply for tickets. Tea will be served in the Library *after* the meeting.)

WEDNESDAY, 6TH DECEMBER, at **2.30 p.m.** '*The Duke of Edinburgh's Award Scheme*', by Sir John Hunt, C.B.E., D.S.O., Director, The Duke of Edinburgh's Award. Sir George Edwards, C.B.E., a Vice-President of the Society, in the Chair.

WEDNESDAY, 13TH DECEMBER, at **6 p.m.** '*Tin: its Contribution to Social Development*', by E. S. Hedges, Ph.D., D.Sc., F.I.M., Director of the Tin Research Institute. The Right Honble. Viscount Chandos, D.S.O., M.C., Chairman, Associated Electrical Industries Ltd., in the Chair.

Fellows are entitled to attend any of the Society's meetings without tickets (except where otherwise stated), and may also bring two guests. When they cannot accompany their guests, Fellows may give them special passes, books of which can be obtained on application to the Secretary.

Official representatives of Companies in association with the Society may also attend, with one guest.

SESSIONAL ARRANGEMENTS

A list of the meetings so far arranged for the forthcoming Session is included as a supplement to this issue of the *Journal*.

FILM EVENING

The first Film Evening of the Session will be held at the Society's House on Friday, 1st December, at 7.30 p.m., when the following films will be screened:

Seawards the Great Ships
The Captive River
The Living Soil

Seawards the Great Ships (29 minutes) was produced by Films of Scotland, from an outline treatment by John Grierson, for the Clyde Shipbuilders' Association. It is a colour film which tells in an imaginative and lively manner the story of the Clyde shipbuilding industry. Among other awards, this film gained a Diploma of Honour at the Venice International Film Festival in 1960 and the principal documentary award at the Cork International Film Festival of the same year.

The Captive River (32 minutes), a colour film produced by Films of Africa for the Shell Company of Rhodesia, is a recent record of the Kariba dam project. It includes some magnificent scenic shots of the Victoria Falls and of the exceptional floods which swamped the construction work at one stage, and shows the progress of 'Operation Noah'—the rescue of wild animals from the valley as the waters rose behind the dam. This film received two awards at the 1961 Venice International Film Festival.

The Living Soil (20 minutes) is also in colour and was produced by the Shell Film Unit. It tells of the enormous losses in the world's foodstuffs caused by various plant pests and diseases, and shows some of the methods used to fight them.

Tickets of admission are not required for this occasion, and Fellows may bring two guests. Light refreshments will be served in the Library after the performance.

DEATH OF MR. C. M. VIGNOLES

With deep regret, we record the death, on 23rd September, aged 60, of Mr. C. M. Vignoles, C.B.E., a Member of Council of the Society since 1958, and a Fellow since 1957. His working life was largely spent in the service of the oil industry, and he recently retired from Shell-Mex & B.P. Ltd., after 10 years as Managing Director.

Charles Malcolm Vignoles was educated at Sedbergh and Magdalene College, Cambridge, where he read mechanical sciences. He joined the Shell Group in 1924 and was sent to Malaya, where he worked on the staff of the Asiatic Petroleum Company, returning to London in 1932 to take up a post in the Fuel Oil Department of the Shell Petroleum Company. In 1940 he was appointed the Company's representative on the Overseas Supply Committee of the Petroleum Board, of which he subsequently became Joint Executive Secretary, with the responsibility of solving a succession of critical wartime problems. After the war he was for some time Eastern Area Manager of the Shell Group before his election to the Board of Shell-Mex & B.P. Ltd. in 1950. He became Managing Director in the following year.

Vignoles had been made O.B.E. for his wartime work in 1946. In 1957 he was advanced to C.B.E. in recognition of his valuable services to the industry and the nation during the Suez canal crisis, when he was Chairman of the Oil Industry Emergency Committee called into being by the Ministry of Power. From 1956-8 he was President of the Institute of Petroleum.

Vignoles devoted much time and thought to voluntary service. He was Chairman of the Public Schools Appointments Bureau, and of the governing body of Sedbergh School. He was a Governor of Ashbridge College, a Trustee of the Civic Trust, and Honorary Treasurer of the National Council of Social Service. During his comparatively short association with the Royal Society of Arts, he took close interest in its work. In particular, he proved a far-seeing member of the Committee set up by the Council to consider the whole matter of industrialization in the countryside, and gave valuable help to those engaged on the Society's survey of this question in the Hampshire Basin.

RESULTS OF THE OFFER OF ENDOWED PRIZES

In accordance with the terms of certain bequests, the Society this year again offered two prizes under the terms set out below. The results of these offers are now announced.

1. *Howard Prize for Mechanical Motive Power*

A prize of £50 was offered for a treatise on some aspect of the subject of motive agents.

One entry was received, an essay by Dr. Kenneth Cochran entitled 'A note on the use of high expansion and excess air in the petrol engine: the design and performance of an experimental motor'. In the opinion of the judge, Mr. Julian S. Tritton, M.I.C.E., M.I.Mech.E., President of the International Federation of Consulting Engineers, this essay is fully up to the standard required by the award: it is a most meticulous account of Dr. Cochran's research and efforts to improve the efficiency of the petrol engine. The work described avoids duplication of the labours of other pioneers in the field, and the overall result is encouraging, and has given a lead for further investigation.

The Council have awarded the full prize to Dr. Cochran, a copy of whose essay, complete with illustrations, may be examined at the Society's House.

It may be remembered that Dr. Cochran was awarded the Howard Prize in 1960 for his treatise 'The status of the petrol engine in light road transport, with a note on a method of improving its thermal efficiency'.

2. *Fothergill Prize for Fire Prevention or Fire Fighting*

A prize of £20 was offered for a descriptive essay or model embodying some new idea for the prevention or suppression of fire.

Six essays were received. The judge was Mr. D. I. Lawson, Director of the D.S.I.R. Fire Research Station at Boreham Wood, who reported that Mr. R. E. Sant's suggestion for 'An automatic door stop' was the most inventive idea submitted, and one which should find a wide range of application.

The Council have accordingly awarded the full prize to Mr. Sant, whose essay is published on p. 977 of this issue of the *Journal*. The Council have also decided that two of the entries should be commended: namely, Mr. G. T. Luke's description of an 'Exposure nozzle/water curtain', a novel and practical device designed by himself and Mr. P. E. Rose (both Fire Prevention Officers, National Research Council of Canada), and an ingenious suggestion for the use of a distinctive smoke-producing powder put forward by Sub-Officer Antony S. Conway, of Manchester Fire Brigade. These two essays may also be seen at the Society's House.

THE SOCIETY'S CHRISTMAS CARD

Orders for the Society's Christmas Card are now being executed, and Fellows who wish to order a supply are asked to use the special form provided at the back of this issue.

A specimen Card will be sent on request.

INDUSTRIAL ART BURSARIES EXHIBITION

The exhibition of winning and commended designs submitted in the 1960 Industrial Art Bursaries Competition is on view at the Middlesbrough College of Art, Green Lane, Linthorpe, Middlesbrough, until 3rd November, and at the Peel Park Technical College, School of Art and Industrial Design, Salford 5, from 13th to 24th November.

MEETING OF COUNCIL

A meeting of Council was held on Monday, 9th October, 1961. Present: Lord Nathan (in the Chair); Sir Hilary Blood; Lord Bossom; the Honble. G. C. H. Chubb; Lord Conesford; Mr. R. E. Dangerfield; Sir George Edwards; Mr. P. A. Le Neve Foster; Mr. John Gloag; Dr. Stanley Gooding; Sir Ernest Goodale; Dr. R. W. Holland; Mr. J. C. Jones; Mr. Edgar E. Lawley; Sir Harry Lindsay; Mr. Sidney Loweth; Mr. F. A. Mercer; Mr. Oswald P. Milne; Sir Ronald Nesbitt-Hawes; Mr. Paul Reilly; Sir Gilbert Rennie; Sir Philip Southwell; Mr. G. E. Tonge; Dr. P. F. R. Venables; Mr. Hugh A. Warren; Sir Harold Wernher; Miss Audrey Withers, and Sir Walter Worboys; with Dr. K. W. Luckhurst (Secretary); Mr. G. E. Mercer (Deputy Secretary), and Mr. J. S. Skidmore (Assistant Secretary).

ELECTIONS

The following candidates, whose applications had been received since the last meeting in July, were duly elected Fellows of the Society:

à Brassard, Forbes, Jordans, Bucks.
Adewale, Mauritala Afolabi Alabi, London.
Baker, Frederick Joseph William, A.C.I.S., Barnstaple, Devon.

Blandford, Francis Gilbert Henry, Horsham, Sussex.
Brencher, John Frederick, N.D.D., Leicester.
Bryant, Henry Oliver, Greenford, Middx.
Cairns, Mrs. Mary Miller, Glasgow.
Carter, Eric Victor, Wednesfield, Staffs.
Cawley, Charles Mills, C.B.E., Ph.D., D.Sc., West Wickham, Kent.
Chambliss, Robert Nelson, LL.B., Lookout Mountain, Tennessee, U.S.A.
Clausen, Hugh, O.B.E., I.S.O., B.Sc.(Eng.), London.
Coker, Henry Theodore Okeade, LL.B., Lagos, Nigeria.
Chapman, Mrs. Eveline, Halifax, Yorks.
Colman, Colin Robert, F.R.I.C., London.
Cooper, John Edward, L.R.A.M., L.T.C.L., Spennymoor, Co. Durham.
Corbett, George Richard, Wordsley, Worcs.
Crawley, Ronald, Kingston-upon-Thames, Surrey.
Crook, Michael Alan Mayoh, N.D.D., Preston, Lancs.
Crowe, Arthur George, A.M.I.Struct.E., Hornchurch, Essex.
de Noronha, Maria, B.A. (Mrs. Harold Shafron), Charleston, South Carolina, U.S.A.
Engel, Jr., Michael M., New York, U.S.A.
Evers, Henry Herbert, B.Sc., Ph.D., F.R.I.C., Weybridge, Surrey.
Field, Colin Walter, Robertsbridge, Sussex.
Firth, Miss Pamela Raie, B.A., Hong Kong.
Forster, Ralph Antony, London.
Goodfellow, Lieut-Col. Hodgson, M.B.E., C.D., M.E.I.C., B.Sc.(M.E.), Edmonton, Alberta, Canada.
Gray, John, A.R.I.B.A., Walton-on-Thames, Surrey.
Green, Mrs. Megan, Pontefract, Yorks.
Greenfield, Anthony Aynsley, Sheffield.
Greenwood, Major Arthur Alexander, Tunbridge Wells, Kent.
Halter, Mrs. Helen O., B.F.A., New York, U.S.A.
Hamilton, Mrs. Margaret Ritchie, Dunfermline, Fife.
Harker, Thomas Swinburne, A.R.I.B.A., Wirral, Cheshire.
Hatt, Leslie, New Barnet, Herts.
Henry, The Revd. Francis Leslie, Amersham, Bucks.
Hodgson, John Tweedale, B.A., Windsor, Berks.
Hooi, Christopher Liang Yin, B.A., Singapore.
Jay, William, Guildford, Surrey.
Jenkins, Keith Frank John, Bristol.
Johnson, Stanley Floyd, Maidstone, Kent.
Johnson, Leonard Richard, London.
Kegel, William Francis, Ellwood City, Pa., U.S.A.
Kemp, Franz Charles, Melbourne, Victoria, Australia.
Khan, Nasim Alam, B.Sc., Karachi, Pakistan.
King, John Terence, Thornton Heath, Surrey.
Knaust, Edward, LL.B., Watton, Norfolk.
Kwok Pak Wing, Hong Kong.
Lampe, Mark Luder, Wanganui, New Zealand.
Latham, Edward Bryan, M.M., Barnet, Herts.
Lee Yuen Hoong, Kuala Lumpur, Malaya.
Lewin, Keith Kerton, D.F.A., Kingston, Jamaica, West Indies.
Lindy, Kenneth John, F.R.I.B.A., London.
Lloyd Thomas, Miss Mary Gwyneth, M.A., B.Litt., London.
Lovell, Stuart Maynard, O.B.E., E.R.D., T.D., M.I.C.E., Wakefield, Yorks.
Lowe, William Fraser, London.

McKibbin, Hugh, M.Sc., Ph.D., A.M.I.E.E., Zaria, Nigeria, West Africa.
McMurtry, Robert Gerald, A.B., Litt.D., LL.D., Fort Wayne, Indiana, U.S.A.
Morgan, Guy, F.R.I.B.A., London.
Moss, Alderman Abraham, M.A., J.P., Manchester.
Parker, William Shepherd, V.R.D., M.B., Ch.B., D.I.H., D.P.H., Brighton, Sussex.
Pilkington, Iain David Bruce, M.I.C.E., Cobham, Surrey.
Prehn, Hans E., New York, U.S.A.
Purkis, Stanley Gilbert, O.B.E., M.I.Mun.E., London.
Rousseau, Jr., Joseph Rodolphe, B.Com., Montreal, Quebec, Canada.
Rowles, Tony Cecil, Birchvale, Derbyshire.
Ruston, Rudolf Steadman, M.B.E., Oakville, Ontario, Canada.
Scarlett, Frank, B.A., F.R.I.B.A., London.
Simmons, Charles Howard, A.R.I.B.A., Dip.T.P., Lytham, Lancs.
Solly, William John, Maidstone, Kent.
Statham, John Desmond, Chalfont St. Giles, Bucks.
Stead, Malcolm Law, A.T.I., Bradford, Yorks.
Tallon, John Ernest, L.T.C.L., Redruth, Cornwall.
Taylor, Miss Marian, Rossendale, Lancs.
Timewell, Henry Jonathan, Southsea, Hants.
Tottle, Jeffrey Raymond, A.T.C.L., Taunton, Somerset.
Tucker, John David Allan, N.D.D., High Wycombe, Bucks.
Upton, Patrick Bernard George, Ashtead, Surrey.
Veronique, Sidney Eugene, Kingston-upon-Hull, Yorks.
Vining, Frederick Herbert, London.
Voller, Peter George, London.
Walker, John Barras, Toronto, Ontario, Canada.

The following candidate was elected an Associate:

Hobson, Alan Charles, Northampton.

The following was admitted as an Institution in Union with the Society:

The College of Further Education, Slough, Bucks.

The following Companies were admitted into association with the Society:

Ford Motor Company Ltd., Dagenham, Essex.
Thos. W. Ward Ltd., Sheffield.
Turners Asbestos Cement Company Ltd., Manchester.

DEATH OF MR. C. M. VIGNOLES

The Council learnt with deep regret of the death of Mr. C. M. Vignoles. (See obituary notice on p. 909.)

PRESENTATION OF THE ALBERT MEDAL

It was announced that His Royal Highness the President would present the Albert Medal for 1961 to Dr. Walter Gropius at Buckingham Palace on 7th November.

BENJAMIN FRANKLIN MEDAL

Approval was given to a variation in the terms governing the award of the

Benjamin Franklin Medal to allow this medal to be used for the encouragement of Anglo-American co-operation.

ASSOCIATED EXAMINING BOARD FOR THE G.C.E.

Mr. Hugh A. Warren was appointed to represent the Society on the Associated Examining Board of the General Certificate of Education.

ANNUAL RECEPTION

Consideration was given to arrangements for the 1962 Annual Reception of the Society.

ANY OTHER BUSINESS

A quantity of financial and other business was transacted.

REPORT ON THE SOCIETY'S EXAMINATIONS FOR THE SESSION 1960–61*

INTRODUCTION

The statistical tables which are published every year as an addendum to the examiners' reports and which, for the Session 1960–61, are printed on pages 921 to 926 of this issue of the *Journal*, suggest two quite different lines of thought. In the first place, as statistics, they are the numerical expression of a year's work in the Society's Examinations Department; and, in the second, in that they refer to the 'trials and tribulations' of several hundred thousand examinees, they invite some sort of human interpretation and appraisement. Both lines of thought are informative.

A glance at the tables shows that, in the year under review, examinations were held in between 60 and 70 different subjects, principally of general or of commercial education, that many of the subjects were graded in two or three distinct standards of difficulty, that four series of examinations were held during the session, and that the number of papers worked approached half a million—a very large volume of work and a noteworthy achievement.

In his Introduction to the Report for the Session 1958–59, Dr. Holland presented a graph illustrating the annual increase in the number of subject entries since 1952. Each year the slope of the line became steeper; each year was a 'record'. The line is still rising, more and more steeply.

We live in an age of examinations and certificates, and it is certainly a laudable object to wish not merely to acquire knowledge and skill but also to seek a tangible means of proving, where proof is relevant, that one has in fact gained the skill, the knowledge, that one can do the job. A minority—though a fairly substantial minority—of the Society's certificates (e.g., those awarded at the higher speeds in shorthand and typewriting, the Shorthand-Typists' certificates, the Teachers' certificates, and a few others) belong to this category; they constitute nationally recognized qualifications. The remainder, however, do not—at any rate, they are not so obviously seen to do so. They do not confer a professional status; they do not exempt the examinee from the examinations of other authorities. It seems reasonable to conclude that the majority of the Society's examinations are worked for and attempted for their own intrinsic worth; one is tempted to say that most of the examinees work for the fun of learning and the thrill of hitting a target, and that the Society's certificates carry their own reward. The great mass of the young—and not so young—people are students by choice, voluntarily attending evening classes regularly throughout winter and spring, in most cases after a day's work in the factory, the office, the school, or the home.

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* A fuller report, containing lists of prize-winners and medallists, and the individual reports of the examiners in the various subjects, will be published as a separate pamphlet by the Examinations Department later this year, and a copy of it may be obtained by Fellows on application to the Examinations Officer.

This interpretation implies that an important factor in the remarkable and continuous growth of the work of the Examinations Department over the past decade is the confidence and good will that exist between the Society on the one hand and the candidates on the other—and not merely the candidates as individuals: for the Society's reputation among the students for competence and fair dealing is a product of the generous co-operation which, in all aspects of the work, local education authorities, heads of schools and colleges, teachers and teachers' associations, commercial and professional bodies, and, by no means least, H.M. Inspectors of the Ministry of Education, have freely given to the Society over many years. Without this inspiring co-partnership the Examinations Department would long since have ceased to function.

J. P. IVENS

ENTRIES AND PAPERS WORKED

The following table gives a detailed comparison of the number of subject-entries received for the various examinations conducted by the Society in the Sessions 1960–61 and 1959–60, and also of the number of papers worked:

Examination	*Entries*		*Papers Worked*	
	1960–61	1959–60	1960–61	1959–60
Ordinary (Single-Subject)	338,914	302,749	321,258	285,880
School and Senior School Certificates	77,333	65,610	73,521	62,991
Oral Tests	8565	8279	8340	8203
Grouped Course	28,531	29,107	25,360	28,017
Teacher's Certificate in Shorthand	962	1103	922	1087
Teacher's Certificate in Typewriting	789	616	761	609
Road Transport Subjects	1191	1232	1140	1184
British Transport Commission (Preliminary Examination of Candidates under Apprenticeship Schemes)	928	1084	840	996
Royal Air Force Administrative Apprentices (Endorsement of Certificates Awarded by the Air Ministry)	235	140	235	140
Totals ...	457,448	409,920	432,377	389,107

GENERAL REMARKS

During the present Session the total number of subject-entries increased by 47,528.

In the Report on the examinations in Session 1957–58, there was a list of the totals of subject-entries for the years 1952–1958 showing that, in that period, the demand for the Society's examinations increased by over 100 per cent—from 130,132 in 1952 to 270,504 in 1958. In recent years this upward trend has continued, as will be seen from the following details:

1959—346,267 subject-entries
1960—409,920 „ „
1961—457,448 „ „

To meet the extreme pressure of work in connection with these ever-increasing numbers of entries, and to prepare for other commitments, the Council have now arranged for the Examinations Department to take over additional accommodation in the Society's building.

ORDINARY (SINGLE-SUBJECT) EXAMINATIONS

The very satisfactory increase in demand for these examinations, which have developed from the original scheme instituted in 1856, was spread over the four Series. The following table gives full details:

Series	*Entries*	*Increase*
Autumn, 1960 ...	40,664 ...	3,190
Easter, 1961 ...	57,749 ...	3,471
Whitsun, 1961 ...	68,614 ...	2,004
Summer, 1961 ...	171,887 ...	27,500

Candidates took the examinations at centres in all parts of the British Isles, but there were also entries from pupils of schools throughout the world for children

of British service personnel, and a large number of entries from candidates in various parts of the Commonwealth: Nigeria—31,296; Ghana—1,328; West Indies—1,228; Kenya—852; Tanganyika—672; Sierra Leone—641; Aden—411; Gibraltar—354; Brunei—269; British Honduras—266; Bermuda—208; Fiji—194. In addition, there were a few centres in foreign countries, mainly for the examinations in English, under the control of officials of the British Embassy or of the British Council.

SCHOOL AND SENIOR SCHOOL CERTIFICATE EXAMINATIONS

The School Certificate examinations have developed from a scheme, instituted in 1927, for the award of a certificate to secondary-school pupils passing in a prescribed group of subjects of a general and commercial nature. Now the scheme covers a much wider group of general subjects, including a number with a 'commercial', 'technical', or 'domestic' bias. This year, the subjects of Music and Rural Science were introduced. The Certificate is designed for boys and girls of about 16 years of age completing a five-year secondary-school course, the pass level being approximately equivalent to the former General School Certificate examinations and Stage I of the Ordinary (Single-Subject) examinations: a pass with credit, for which 70 per cent of the total marks is required, may be considered as comparable in standard to the Ordinary level of the General Certificate of Education.

In 1961 the number of subject-entries at the School Certificate examinations was 75,639, an increase of 11,178 over the total for 1960. These were submitted by 10,675 candidates at over 600 schools in various parts of England, Wales, and Northern Ireland, as well as from the schools for children of British service personnel throughout the world, and 1,052 candidates in Nigeria.

The Senior School Commercial Certificate examinations were also instituted in 1927 and, in standard, are comparable to Stage II of the Ordinary (Single-Subject) examinations. In 1961 there were 1,694 subject-entries, including 362 from candidates in Nigeria.

GROUPED COURSE EXAMINATIONS

The Grouped Course examinations were designed for students of junior evening institutes in the County of London wishing to proceed to a senior evening institute. Since 1927 they have been organized by the Society on behalf of the Education Committee of the London County Council, but for many years entries have also been accepted from candidates at centres outside London, including a large number from pupils of secondary schools in the Home Counties.

This year the number of subject-entries dropped by 576, from 29,107 in 1960 to 28,531 in 1961. There would appear to be two major contributory factors in this: (1) the decision of the Education Committee of the London County Council that in 1960 and succeeding years entries from secondary-school pupils in London would not be permitted for the Grouped Course examinations, and (2) the increasing demand for the School Certificate examinations by secondary-school pupils in the Home Counties.

TEACHERS' CERTIFICATES IN SHORTHAND AND TYPEWRITING

In November, 1960, there were 408 candidates for the examination in Shorthand, of whom 162 passed in all Sections and 13 were 'referred' in the Speed Test only; in addition, 30 were granted exemption from Part I and 9 from Part II. In Typewriting there were 307 candidates, of whom 84 passed in all Sections, 23 were granted exemption from Part I and 25 from Part II: exemption is allowed, at the discretion of the Society, for good work in one Part of the examination.

In May, 1961, revised regulations and syllabuses were introduced, the main

purpose of which was the strengthening of the teaching aspects of the subject. In Shorthand there were 514 candidates, of whom 182 were successful, 54 were granted exemption from Part I and 35 from Part II. In Typewriting there were 454 candidates, of whom 149 were successful, 51 were granted exemption from Part I and 39 from Part II.

EXAMINATIONS IN ROAD TRANSPORT SUBJECTS

Once again there was a slight drop in the number of entries for the examinations in Road Transport subjects, despite intensive publicity by the National Committee on Road Transport Education. The benefits of the scheme of studies leading to these examinations do not appear to be fully appreciated by employers and employees, particularly on the 'goods' side of the transport industry.

OTHER EXAMINATIONS

The special examinations in connection with the apprenticeship schemes of the British Transport Commission were held in April, 1961. These were designed to help in the selection of Traffic and Accountancy Apprentices of British Railways, and of the Traffic Apprentices of British Waterways. Each candidate was required to work papers in English, and Geography/General Knowledge, as well as a special paper in his particular field of study, viz., Railway Subjects—Commercial and Operating, or Railway Accounts and Statistics, or Waterways Traffic Operation and Administration.

Further examinations in connection with the scheme of endorsement by the Society of certificates awarded by the Air Ministry to Royal Air Force Administrative Apprentices were held in October, 1960, February, 1961, and May, 1961. These certificates cover examinations in the Intermediate Stage of English and Arithmetic, and in the Elementary Stage of Book-keeping (Principles of Accounts).

MEETINGS OF COMMITTEES

During the Session there were a large number of meetings of the various committees connected with examinations, on which the Society has valued the help and advice of officials of central and local education authorities, of head teachers and specialist teachers, and of members of professional bodies and business organizations.

Various changes recommended by the committees have been approved. These include the introduction of the award of a Group Certificate in Clerical Studies for clerical workers taking a two-year commercial grouped course, the revision of syllabuses in Arithmetic, Stage I, and Commerce, Stages I and II, the replacement of the examination in History, Stage I, by one on Modern British History covering the period from 1750 to 1950, and the introduction of new examinations in Office Practice, Stages I and II.

Revised regulations for the School and Senior School Certificate examinations have also been approved. In 1962, candidates for the School Certificate examinations may enter for English Language alone or for English Language together with any one or more subjects in the scheme. But, to encourage the taking of a group of subjects, the Society will continue to award the School Certificate, the School Certificate (Commercial), or the School Certificate (Technical) to candidates passing in a specified group of five or more subjects. In 1963 the School Certificate scheme will include two separate and distinct examinations entitled Mathematics I and Mathematics II in place of the existing examinations in Mathematics, Papers A and B. Also, in 1963 the scheme for the Senior School Commercial Certificate will be replaced by one more suitable for students of about 17 years of age taking full-time secretarial and commercial courses. The revised scheme will be entitled 'The Secretarial and Commercial Certificate Examinations, Stage II (Intermediate)' and will include the existing Senior School subjects as well as

examinations in General Principles of English Law, Office Practice, Statistics, and the Shorthand-Typist's Certificate: candidates will be allowed to enter for English Language alone, or for English Language together with any one or more other subjects, but special group certificates will be awarded to encourage the taking of a group of subjects. (The pamphlet giving full particulars of the School Certificate and the Secretarial and Commercial Certificate Examinations in 1963 will be published in February, 1962.)

ORDINARY NATIONAL CERTIFICATE IN BUSINESS STUDIES

The Council have approved of the collaboration of the Society and the London Chamber of Commerce in the organization of a scheme of external examination which has been approved by the Ministry of Education for the award of the Ordinary National Certificate in Business Studies. The scheme is under the control of a Joint Committee of the two bodies, with the Society's Examinations Officer responsible for the administrative arrangements. This is similar to the arrangements that operated from 1936–40, when the Society and the London Chamber of Commerce, acting in collaboration, offered a scheme of examination for the award of the National Certificate in Commerce.

A special pamphlet has been published, giving the requirements and syllabuses of the examinations to be introduced in June, 1962.

LONDON COUNTY COUNCIL SECONDARY SCHOOLS CERTIFICATE EXAMINATION

The Council of the Society have approved the organization, on behalf of the Education Committee of the London County Council, of a proposed new scheme of examination for pupils of about 16 years of age completing a five-year course in a London secondary school. The standard of the examination will be slightly lower than that of the School Certificate examinations of the Royal Society of Arts, and it is suggested that the scheme be instituted in the first half of the summer term of 1963. Candidates will be required to offer at one and the same series of examinations not fewer than four subjects—English, and Mathematics or Science, plus two, or more, of the other subjects in the scheme.

The arrangements for this new scheme are under the control of a specially appointed Management Committee, on which there are representatives of the London County Council and of the Royal Society of Arts. A number of subject panels have been appointed by the L.C.C. Education Officer, and it is hoped that their recommended syllabuses and specimen questions may be prepared and approved by the Management Committee in good time for publication early in 1962.

ASSOCIATE MEMBERSHIP

Three Silver Medallists in the Society's examinations in 1960 have been elected to Associate Membership.

MEDALS

The Worshipful Company of Clothworkers has again generously contributed towards the cost of the silver and bronze medals awarded on the recommendation of the examiners to candidates obtaining very high marks in the Advanced and Intermediate Stages of the Society's examinations.

GROUPED COURSE EXAMINATIONS, 1961, IN THE ADMINISTRATIVE COUNTY OF LONDON

Number of Candidates, 398; *Grouped Course Certificates Awarded: Commercial*, 17; *General*, 3; *Technical*, 49

ELEMENTARY

Subject	Passed with Credit			Passed			Not Passed			Papers worked at Whitsun and Summer combined
	Whitsun	Summer	Total	Whitsun	Summer	Total	Whitsun	Summer	Total	
Arithmetic	—	1	1	—	2	2	1	7	8	11
Arithmetic & Accounts	—	4	4	1	15	16	2	14	16	36
Commerce	—	1	1	—	6	6	3	4	7	14
Economic Geography ...	—	—	—	—	1	1	—	2	2	3
*English	6	3	9	46	58	104	16	108	124	237
†English Language ...	—	3	3	2	41	43	2	72	74	120
French	—	—	—	—	2	2	1	—	1	3
History	—	—	—	—	2	2	—	2	2	4
Mathematics	9	7	16	20	31	51	33	99	132	199
Office Practice	—	2	2	—	12	12	1	18	19	33
Science	7	10	17	5	22	27	3	32	35	79
Shorthand, 50 w.p.m. ...	—	—	—	—	9	9	1	36	37	46
,, 60 ,, ...	—	2	2	—	5	5	—	3	3	10
Technical Drawing ...	20	29	49	26	62	88	21	50	71	208
Trade Calculations ...	—	4	4	—	4	4	5	31	36	44
Typewriting	—	6	6	1	26	27	—	49	49	82
Totals	42	72	114	101	298	399	89	527	616	1129

STAGE II (INTERMEDIATE)

Subject	1st Class			2nd Class			Not Passed			Papers worked at Whitsun and Summer combined
	Whitsun	Summer	Total	Whitsun	Summer	Total	Whitsun	Summer	Total	
English Language ...	—	1	1	—	8	8	1	3	4	13
Shorthand, 80 w.p.m. ...	—	—	—	—	1	1	—	1	1	2
,, 100 ,, ...	—	—	—	—	—	—	—	1	1	1
Typewriting	—	—	—	—	4	4	—	6	6	10
Totals	—	1	1	—	13	13	1	11	12	26

* English—Technical Grouped Course

† English Language—Commercial and General Grouped Courses

GROUPED COURSE EXAMINATIONS, 1961, AT CENTRES OUTSIDE THE COUNTY OF LONDON

Number of Candidates, 6983; *Grouped Course Certificates Awarded:*

Commercial, 107; *General*, 77; *Technical*, 2107

ELEMENTARY

Subject	*Passed with Credit*			*Passed*			*Not Passed*			*Papers worked at Whitsun and Summer combined*
	Whitsun	*Summer*	*Total*	*Whitsun*	*Summer*	*Total*	*Whitsun*	*Summer*	*Total*	
Arithmetic	76	47	123	42	72	114	24	85	109	346
Arithmetic & Accounts	4	7	11	8	36	44	14	44	58	113
Commerce	2	4	6	23	32	55	11	32	43	104
Economic Geography	3	4	7	29	46	75	117	173	290	372
*English	130	147	277	1004	2263	3267	476	1898	2374	5918
†English Language ...	16	8	24	167	247	414	125	274	399	837
French	3	2	5	15	17	32	26	69	95	132
History	—	5	5	15	71	86	24	105	129	220
Mathematics	253	420	673	552	1334	1886	829	2557	3386	5945
Office Practice ...	—	—	—	22	5	27	46	10	56	83
Science	508	199	707	415	491	906	253	558	811	2424
Shorthand, 50 w.p.m.	15	5	20	21	9	30	28	50	78	128
„ 60 „	8	8	16	18	16	34	10	17	27	77
Technical Drawing ...	509	1327	1836	623	1564	2187	252	712	964	4987
Trade Calculations ...	61	168	229	280	505	785	431	825	1256	2270
Typewriting	40	15	55	48	35	83	26	85	111	249
Totals	1628	2366	3994	3282	6743	10,025	2692	7494	10,186	24,205

* English—Technical Grouped Course

† English Language—Commercial and General Grouped Courses

EXAMINATIONS IN ROAD TRANSPORT SUBJECTS, 1961

	Papers Worked	*1st Class*	*2nd Class*	*Not Passed*
1st Year—Road Transport Operation (Passenger) ...	137	31	71	35
Road Transport Operation (Goods) ...	69	8	37	24
Communication and Report Writing ...	186	12	96	78
Road Transport Accounts	165	7	98	60
2nd Year—Road Transport Operation (Passenger) ...	122	16	80	26
Road Transport Operation (Goods) ...	43	6	24	13
Elements of Road Transport Engineering ...	63	5	26	32
Road Transport Accounts	127	22	47	58
3rd Year—Road Transport Operation (Passenger) ...	75	18	44	13
Road Transport Operation (Goods) ...	27	4	14	9
Road Transport Accounts	59	—	25	34
Economics Applied to Road Transport ...	67	6	43	18
Totals	1140	135	605	400

SENIOR SCHOOL COMMERCIAL CERTIFICATE EXAMINATIONS, 1961

* *Candidates*, 152; *Full Certificates Awarded*, 32

Subject	*Number of Papers Worked*	*Passed 1st Class*	*Passed 2nd Class*	*Not Passed*
Accounts	75	10	32	33
Arithmetic...	52	2	14	36
Commerce...	131	3	64	64
English Language	176	7	88	81
English Literature	98	9	40	49
†French	37	9	11	17
Geography	23	1	6	16
German	1	—	1	—
History	63	5	26	32
History of British Commonwealth ...	1	1	—	—
Mathematics	10	1	3	6
Shorthand, 80 w.p.m.	168	—	117	51
„ 100 „	10	—	4	6
Typewriting	336	50	114	172
Totals	1181	98	520	563

* In addition, the results of 357 papers worked by 44 candidates in Nigeria have not yet been received.

† 7 Candidates took the Oral test in French: none passed.

SCHOOL CERTIFICATE EXAMINATIONS, 1961

**Candidates*, 10,675; *Full Certificates Awarded: School Certificate*, 1701; *School Certificate* (*Commercial*), 1064: *School Certificate* (*Technical*), 1048

Subject	*Number of Papers Worked*	*Passed with Credit*	*Passed*	*Not Passed*
Accounts	1399	251	502	646
Arithmetic	6138	1991	2316	1831
Art	509	92	285	132
Biology	581	26	248	307
Chemistry	423	33	92	298
Civics	1082	95	516	471
Commerce	2107	182	1198	727
Cookery and Nutrition	975	251	650	74
English Language	10,099	656	6105	3338
English Literature	3363	139	1723	1501
†French	649	113	272	264
General Science	2260	524	1145	591
Geography	4326	63	1376	2887
Geometrical and Technical Drawing	3610	687	1752	1171
German	27	2	9	16
History of the British Commonwealth	413	35	130	248
Housecraft	46	28	15	3
Human Biology and Hygiene	533	28	251	254
Italian	3	1	—	2
Mathematics Paper A	4922	1948	1597	1377
„ Paper B	4556	1225	1539	1792
Mechanics	524	99	199	226
Metalwork (with Drawing)	1922	89	1133	700
Modern British History	2370	57	603	1710
Music	39	17	11	11
Needlecraft	656	119	390	147
Physics	2470	460	1076	934
Religious Knowledge	1081	197	547	337
Rural Science	27	1	15	11
Shorthand, 50 w.p.m.	1925	168	398	1359
„ 60 „	1063	427	304	332
‡Spanish	31	2	5	24
Typewriting	3742	1230	1276	1236
Welsh	32	7	21	4
Woodwork (with Drawing)	1537	124	796	617
Totals	65,440	11,367	28,495	25,578

* In addition, the results of 6543 papers worked by 1052 candidates in Nigeria have not yet been received.

† 106 candidates took the oral test in French: 23 passed with credit, 34 passed.

‡ 2 candidates took the oral test in Spanish: 1 passed with credit, 1 passed.

ORDINARY (SINGLE-SUBJECT) EXAMINATIONS

AUTUMN SERIES, 1960, AND EASTER, WHITSUN, AND SUMMER SERIES, 1961

Subject	Stage	Papers worked	1st Class (or Passed with Credit in Stage I)	2nd Class (or Passed in Stage I)	Not Passed	Total number of papers worked in each subject	
						1961	1960
Accounting...	III	222	1	36	185	**222**	201
Advertising...	III	30	1	8	21	**30**	32
Arithmetic	I	25,344	6679	10,231	8434		
,, ...	II	4281	672	1279	2330	**29,889**	25,466
,, ...	III	264	14	70	180		
Book-keeping	I	11,052	1141	4665	5246		
,, ...	II	5069	1212	1877	1980	**17,700**	16,907
,, ...	III	1579	38	416	1125		
Cargo Insurance	III	2	—	1	1	**2**	7
Central and Local Government	II	172	22	73	77	**172**	121
Civics	I	366	32	181	153	**366**	250
Commerce	I	4888	266	2090	2532		
,, ...	II	1728	31	533	1164		
,, (Finance) ...	III	69	—	41	28	**6843**	6652
,, (International Trade)	III	124	—	61	63		
,, (Marketing) ...	III	34	—	3	31		
Commercial Law	II	167	14	80	73	**215**	156
,, ,, ...	III	48	1	21	26		
Common Law	III	43	4	22	17	**43**	31
Company Law	II	67	1	25	41	**144**	96
,, ,, ...	III	77	—	15	62		
Costing	II	81	1	19	61	**115**	151
,, ...	III	34	2	20	12		
Danish	I	3	—	2	1		
,, ...	II	3	1	2	—	**6**	7
,, ...	III	—	—	—	—		
Dutch	I	7	—	5	2		
,, ...	II	1	—	—	1	**10**	18
,, ...	III	2	—	1	1		
Economic Geography ...	I	2788	108	820	1860		
,, ,, ...	II	508	18	93	397	**3441**	3172
,, ,, ...	III	145	1	33	111		
Economic & Social History	II	523	5	153	365	**675**	673
,, ,, ,,	III	152	—	43	109		
Economics	II	1429	43	509	877	**1643**	1621
,, ...	III	214	7	72	135		
English (with Literature) ...	I	2671	140	1310	1221		
,, ,, ,, ...	II	617	12	290	315	**3777**	3566
,, ,, ,, ...	III	489	13	251	225		
English for Foreigners ...	I	3582	1352	1166	1064		
,, ,, ,, ...	II	3287	620	1428	1239	**7254**	6588
,, ,, ,, ...	III	385	38	150	197		
English Language	I	41,447	1704	21,531	18,212		
,, ,, ...	II	15,105	822	6335	7948	**57,514**	50,865
,, ,, ...	III	962	9	210	743		
Esperanto	I	35	12	14	9		
,, ...	II	21	8	9	4	**61**	81
,, ...	III	5	2	2	1		
French	I	2471	200	674	1597		
,, ...	II	417	36	120	261	**3025**	3268
,, ...	III	137	9	44	84		
General Principles of English Law	II	634	26	191	417	**634**	316
German	I	351	66	140	145		
,, ...	II	97	18	43	36	**482**	436
,, ...	III	34	6	16	12		

AUTUMN SERIES, 1960, AND EASTER, WHITSUN, AND SUMMER SERIES, 1961—*continued*

Subject	Stage	Papers worked	1st Class (or Passed with Credit in Stage I)	2nd Class (or Passed in Stage I)	Not Passed	Total number of papers worked in each subject 1961	1960
History	I	924	22	414	488	924	838
History of the British Commonwealth	I	139	8	78	53		
" " "	II	178	5	99	74	365	389
" " " ...	III	48	—	21	27		
Income Tax Law and Practice	III	8	1	3	4	8	9
Italian	I	210	73	79	58		
"	II	86	23	39	24	331	367
"	III	35	3	20	12		
Law of Evidence and Civil Procedure	III	6	—	4	2	6	15
Law of Trusts	III	6	—	5	1	6	7
Mathematics	I	2787	696	918	1173	2787	—
Norwegian	I	2	1	1	—		
"	II	5	2	2	1	9	7
"	III	2	—	1	1		
Public Administration ...	III	124	6	29	89	124	89
Real Property and Conveyancing	III	16	—	6	10	16	7
Russian	I	71	23	20	28		
"	II	31	8	9	14	110	139
"	III	8	3	2	3		
Secretarial Duties	II	2546	177	1333	1036	2546	1518
Shipping Law and Practice	III	23	—	5	18	23	20
Spanish	I	305	72	106	127		
"	II	103	23	41	39	438	477
"	III	30	2	14	14		
Statistics	II	102	21	55	26	110	122
"	III	8	3	3	2		
Swedish	I	1	—	—	1		
"	II	—	—	—	—	2	1
"	III	1	—	1	—		
Typewriting	I	53,646	19,643	15,411	18,592		
"	II	32,981	3403	11,477	18,101	96,402	85,844
"	III	9775	320	2811	6644		
Welsh	I	30	6	20	4	30	17
	Stage	*Papers worked*	*Passed with Distinction*	*Passed*	*Not Passed*		
Shorthand-Typist's Certificate	II	5010	714	2377	1919	5640	4861
" " "	III	630	26	263	341		
		Papers worked	*Passed with Credit*	*Passed*	*Not Passed*		
Shorthand :							
50 words per minute... ...		22,708	4476	5404	12,828		
60 " " "		12,887	4058	3530	5299		
		Papers worked		*Passed*	*Not Passed*	76,413	70,472
80 " " "		25,247		11,102	14,145		
100 " " "		9401		3283	6118		
120 " " "		5528		1790	3738		
140 " " "		571		187	384		
150 " " "		55		12	43		
160 " " "		16		6	10		
					Totals	320,553	285,880

In addition, the results of 705 papers worked at oversea centres have not yet been received.

THE PRESENTATION OF SCIENCE AND THE ARTS ON TELEVISION

Three Cantor Lectures

I. THE PRESENTATION OF SCIENCE

by

TOM A. MARGERISON, Ph.D.,

delivered to the Society on Monday, 1st May, 1961, with Mrs. Mary Adams, O.B.E., M.Sc., lately Director, Television Talks Features, B.B.C., and a Member of Council of the Society, in the Chair

THE CHAIRMAN: Some of those present may not know that Cantor Lectures have been delivered since 1862, and have been mainly concerned with scientific and technological subjects. This evening we have before us rather a special aspect of science: its application not directly to industry and commerce, but to a much wider field of social and cultural life. The Pilkington Committee, I understand, is still snowed under with evidence, mainly concerned with problems of organization and authority. These lectures are intended to be mainly expository. No doubt they will be controversial as well.

Tom Margerison is known to millions of television viewers. He is also known to thousands of readers of a Sunday paper and to perhaps hundreds of readers of a certain weekly which he has made distinguished. I have known him since the time when he made a very important decision—to leave the pleasant groves of Academe and enter the perilous world of the scientific journalist. I hope it is a decision that he has never regretted! I am sure at least that it is one which all of us have benefited from, because it is very important that science should be communicated in a trustworthy as well as in an interesting manner.

The following lecture, which was illustrated with television films, was then delivered.

THE LECTURE

The biggest problem facing Britain to-day is an educational one. Many of the symptoms have been mulled over time and again by people far more competent than I am. The problems have been discussed in the intellectual weeklies under catch phrases like 'the two cultures'. Earnest people have written letters on the subject to respected newspapers. The essence of their argument is very simple. Britain is a small country with rather few natural resources and a large population. The only way in which she can retain her present standard of living is by selling skills overseas, and those skills are predominantly scientific and technical ones. I say predominantly because skill in artistic design is also extremely important, but unfortunately our abilities as designers are not apparent in the bulk of goods which industry produces.

In spite of the importance, indeed the necessity, of science and technology, the 10 or 15 per cent of the population who guide the destiny of the country, the professional men, the majority of the teachers, the industrialists, the politicians are almost completely ignorant about science. Of course, it can equally well be said that the scientists and technologists are ignorant about history, literature, Greek, the visual arts and all the other subjects that are lumped together as 'culture'. But there is one difference. Many of those with a 'cultural' background are almost proud of their scientific virginity. I have yet to hear a scientist proclaim proudly that he knows not one iota of history, or that he has never read a word of Shakespeare.

The bridging of this gap in the most influential part of the population is of great urgency. Television has its part to play, along with newspapers, periodicals and other methods of communication. But television's power as an educational medium lies in the fact that its audience is so wide: far wider than the top tenth or fifth of the population. It is thus impossible, at least until there is a further television channel, to think in terms of using the television medium specially to play this part. But, as I shall mention later, there are many ways in which television could help to close the gap within the framework of the present programme structure.

The main function of a television programme, however, at least until more channels are available, is to appeal to a large part of the population. While the 'influential crust' show little interest in science, I believe that the remainder of the population is more interested in scientific subjects than any other type of serious programme. Scientific programmes appear to be of special interest to the growing body of technicians in industry: mechanics, plant controllers, radio and electronics engineers, electricians, welders and a host of others. As might be expected, they seem to be more interesting to men than to women. The degree of interest is shown by the size of the audience which for many recent scientific programmes has been around five million. This compares with a figure of around eight million for a very popular general programme like 'Tonight'. But audience figures alone are deceptive because they depend very much on the time of transmission.

In presenting programmes on scientific subjects, the television services are doing more to influence the country's attitude to science than anyone else. The influence of the television programme is easy to under-assess. A short time ago Sir Lawrence Bragg gave a series of lecture demonstrations at the Royal Institution in London which were broadcast over the B.B.C. television network. More people watched each lecture than could have attended in person in the Royal Institution's lecture hall had Sir Lawrence Bragg been prepared to repeat the same lecture every night until the end of the century.

The ability of television to capture a large audience is largely wasted unless the fare that is offered them is of first-rate quality. How should science and technology be handled on television? There is room for many different approaches. What is suitable for a schools programme with its captive audience expecting to be taught is wholly unsuitable for a mid-evening programme. In the latter case the audience is watching in its leisure time and demands that what is offered shall

be interesting and entertaining. The moment boredom sets in, the evening viewer can find alternative things to watch at the flick of a switch.

The power of the wavechange switch is something which both television channels have to reckon with. In a way it is not a bad thing. But there is a noticeable tendency for the commercial network, which depends of course on the number of its viewers for its bread and butter, to play safe and to seek programmes which will command the greatest number at the expense of quality and individual interest. To offset this trend and no doubt to forestall criticism, the commercial companies occasionally include a 'prestige' programme, sometimes on a scientific subject, which they advertise widely in quality newspapers and periodicals. But in spite of this the number of scientific programmes from the commercial network is well below that from the B.B.C.

The very low level of general knowledge about science means that any form of science popularization inevitably involves communicating a considerable body of facts before the general argument can be appreciated. The conflicts of ideas, when they are understood, are as satisfying as in any of the cultural subjects. But the protective screen of facts which must be scaled before the argument becomes clear is a powerful deterrent.

Some parts of science, like solid state physics, or almost the whole of chemistry, have now advanced so far that the 'fact barrier' is virtually unassailable by non-scientists, and even scientists need to spend a considerable time assimilating the background information.

Strangely enough we have reached a stage where the layman can participate most easily in arguments in those fields of science like cosmology where relatively little is known. The reason is simply that he has fewer facts to master before he reaches the point where he can enter the argument. This I think is why the recent controversy between Professors Ryle and Hoyle on the origin of the universe aroused so much lay interest. One of the virtues, of course, of cosmology is that hard facts are so difficult to find that almost anyone can put forward his pet theory without much risk of being proved wrong.

Sometimes facts alone can be interesting. Certainly programmes stating only established facts have their place both for schools and entertainment. But some of these programmes fall into a dangerous trap. In their efforts to hold as large an audience as possible they overdramatize the wonders of science. These programmes are of what I think Sir Eric Ashby has called the 'Cripes' variety. 'Isn't science wonderful' is an attitude of mind even more dangerous than the prejudice of the culture boys. It is responsible for the pseudo-scientific advertisements of the patent medicine manufacturers, for the tooth pastes containing additives with magic properties and names which are parodies of chemicals, for the petrols which 'tests prove' all give higher mileage and more power, for the detergents which all wash whiter.

The aim of science on television is not merely to impart facts and to demonstrate applications, but to give the public a feel for the methods and philosophy of science. Facts are essential in any programme, but one of the first principles of science is that no statement commonly accepted as a fact is too holy to be attacked.

The questioning mind unwilling to accept any statement thrust upon it is the most valuable asset for a scientist. This continual questioning, this conflict between research workers rarely comes over in any form of science popularization. Not long ago I had several letters, following the publicity which surrounded the Ryle-Hoyle controversy, on a common theme. 'How', asked one man, 'can two eminent professors quarrel like this? Will you please tell me which is right.' A lady who told me she had an honours degree in history wrote: 'When two well-known scientists disagree like this I feel I cannot trust any of them.'

Yet neither of these people would feel that two politicians with different views were anything out of the ordinary, or two historians with different theories about the events leading up to the Battle of Hastings were untrustworthy.

You will see now that a few simple rules emerge for those who wish to popularize science on television. Though the rules are simple to list they are remarkably difficult to obey, particularly within the technical confines of a television performance. First, the programme must be entertaining, otherwise it will not get a sufficiently large audience. When alternative television services become available this rule can be interpreted less strictly and more highly specialized programmes included. In fact the much disputed third television service could usefully provide these educational programmes. Secondly, the subject must be suitable. In practice this means that it must be possible to get over the necessary background information within the programme. If this information cannot be got over in the time available the viewer will have to take too much on trust or will be confused. Thirdly, the method of presentation must be such as to make clear the way in which scientists work. Since experiment is the primary tool of science, the demonstration experiment has an important part to play here. But too often the demonstrations are facile and do not reveal the 'detective' essence of the scientists' work and the care and skill with which he plans his experiments.

Nevertheless, there have been some outstandingly good programmes on science in the relatively short period since television restarted after the war. The first television science programme was broadcast by the B.B.C. in 1936 when Professor Winnifred Cullis gave a talk on human physiology and carried out demonstrations on living subjects. Science and medicine were the first documentary subjects to be taken seriously during the pre-war television period.

In the early post-war days a series called 'Science in the making', an extension of a sound radio experiment from 1932, introduced the idea of viewer participation. The audience was invited during the programme to make observations or provide information for a large-scale experiment. For instance, the largest list of identical twins known to medical science was compiled in this way. Being able to participate undoubtedly gave the audience a much closer relationship with the scientists taking part in the programme, but unfortunately the number of worth while co-operative experiments of this kind is very limited.

Since then science programmes have followed two main trends. On the one hand there have been various series of studio-mounted productions in which scientists have described their own work, illustrating it with film and demonstrations simple enough to be transported to the studio. Usually these programmes

bring together numbers of specialists who illuminate different aspects of the subject. Their contributions are integrated by a 'link-man', sometimes a scientist himself and sometimes a layman or scientific journalist.

The other approach is to take the television equipment to the laboratory to watch the scientist at work. In principle, I think this method has great attractions. A visit to the actual working environment should give a much greater degree of authenticity than a studio production. But there are disadvantages. First, it is often difficult to produce a genuine atmosphere within the laboratory because of the problems of introducing cameras. And often the actual apparatus which a scientist is using is unsuitable for demonstration to a television audience. It may be physically difficult to see what is going on, or there may be so much ancillary apparatus that it is needlessly complicated. Also a research worker using the actual experimental apparatus for a demonstration may be more tempted to include qualifications which confuse the main argument than when he is using a simplified version made specially for television. Another problem facing the producers of these outside broadcasts from laboratories is that very often it is impossible to tell the whole story within the bounds of a single laboratory. It may be possible to use more than one outside broadcast unit, or to include in the programme film taken at other laboratories. But where this is not possible people from other laboratories may have to be 'imported' to deal with some aspects of the subject. When this is necessary the advantages of the outside broadcast over the studio become rather small.

The B.B.C. has pioneered the outside television broadcast from laboratories and has been responsible for the important series called 'Eye on Research', which has tackled the most difficult subjects bravely and competently. As a logical extension of this idea came the 'Science International' series in which use was made of the Eurovision link and film shot in laboratories overseas to show how all countries were contributing to the solution of the world's most pressing scientific problems.

Both studio and outside broadcast science programmes have their faults. In my opinion the studio programmes tend to be too didactic and rather too formally educational in their approach, while the 'Eye on Research' type of programme is too much inclined to indulge in showmanship which, although entertaining, sometimes gets dangerously close to the 'isn't science wonderful' approach.

The difficulty, of course, is that the values of television are bound up firmly with the impact of personality on the screen. Many producers are able to pick their performers from people known to 'come over well'. But this is almost impossible for a science programme producer, as only one or two people in the country may be doing the sort of work in which he is interested. Science programmes are inevitably the realm of the amateur television performer, whose imperfect efforts may be bolstered by a professional link-man. But in a way the amateurism of the scientist on television may add to his impact. It carries him out of the province of the actor and the magician who half an hour later will replace him on the same screen. It gives added genuineness and authority to what he is saying.

But this is no excuse for under-rehearsal and rushed preparation, which some of these programmes get.

As I have said, the strength of television is in the impact of personality. Some scientists become sufficiently familiar with the technique to be able to hold their own with anyone else. They are then in a particularly favourable position to communicate the working ideas of science. Pre-eminent among these scientific personalities is Dr. J. Bronowski, who has appeared in several series of programmes both on the commercial network and the B.B.C. His approach to scientific popularization is an excellent one. He does not load his programmes with fact alone but tries to show how the different sciences (and the arts) are integrated, and I am sure has done a great deal to make clear the polemical nature of the subject. In detail, many scientists would disagree with what he has said, but this kind of disagreement is a healthy thing. The main danger is that the power of personality is so strong that these experienced performers are sometimes tempted to use it as a means of gliding over difficult points.

It is a pity that other scientists with an undoubted flair for television presentation could not be persuaded to give up the time needed for an occasional television series. Professor P. B. Medawar has shown tremendous abilities as a popularizer in his brief appearances on television. So did Professor Joseph Rotblat who gave an impressive account of the 1955 'Atoms for Peace' Conference in Geneva. And Sir Alister Hardy and Professor W. S. Bullough are two other television 'naturals'.

In one or two cases the 'linkman' himself has personality and authority enough to carry a programme. The excellent 'Sky at Night' series achieves much of its liveliness from Patrick Moore's infectious enthusiasm. And David Lutyens' youth and charm helped greatly Associated Television's 'It Can Happen Tomorrow'.

A good personality will often carry what is otherwise a bad television programme. A recent example was the series of lecture-demonstrations by Sir Lawrence Bragg broadcast from the Royal Institution. This type of lecture, for which the Royal Institution is rightly famed, is in my opinion unsuitable for television. Yet Bragg's charm and his enthusiasm when a demonstration worked well carried these otherwise outmoded offerings.

Why is it that more Braggs and Bronowskis are not seen on the screen? The answer lies partly with the scientists and partly with the broadcasting organizations. To deal with the scientists first, you must understand that there is no professional reason why a research worker should wish to try to communicate what he is doing to the lay public. To do so does not help his career: in fact, it may jeopardize it. For the scientist, the final reward is to see his work published in the pages of a learned journal. Very often the report is written in a manner which will be intelligible only to specialists, since only a few specialists need to read it. Often the papers are more complicated than they need be. This is partly because learned journals are short of money and demand that papers shall be as short as possible, and partly, I suspect, because many scientists believe that if the papers they publish are difficult to understand people will think that they are engaged on particularly difficult work. The converse is that a television performer is afraid

if he makes things appear too simple that his colleagues will believe that he cannot be engaged on serious or difficult researches. They may even think that he is unaware of the qualifications and detailed side arguments that he has discarded in the quest for simplicity. I remember a few months ago talking for three minutes in a 'Tonight' programme about the centrifuge method for separating uranium-235 from natural uranium. The process, which is being developed in Germany and elsewhere, is a sophisticated one using what is known as a counter-current centrifuge. There seemed to be no chance of explaining this rather difficult concept in the minute or so I had to explain how the process worked, so I simplified drastically and compared the machine with an ordinary cream separator. The next day several scientists wrote or telephoned me to say that I had got it wrong, and started to tell me about the counter-current principle.

These are some of the main factors which make ambitious scientists chary of appearing on television. There are many others, such as the fact that preparing a series of programmes involves an immense amount of time, particularly if, as is often the case, the production team contains no qualified scientist.

The broadcasting organizations are themselves responsible partly for the lack of enthusiasm among scientists to take trouble and time over the preparation of programmes. One of the main reasons is that the fees paid to eminent scientists to appear in programmes are often small, much lower than those of light entertainment artists. Scientists as a group are not particularly grasping for fees, but I am sure that the size of the fee affects the attitude of both scientist and broadcasting organization. There is little honour in taking part in a programme that values one's services and skills at 10 guineas.

The relationship between scientists and the broadcasting organizations is a very important one. It is essential that scientists should realize that improvements are needed on both sides. The scientific bodies which preach loudest about the need for scientific popularization could make their biggest contribution by trying to convince their members that an appearance on television is no shameful thing and that a man who gets asked more than once is not necessarily a charlatan.

So far I have been discussing science programmes as such. I should like to devote a little time to a particularly important aspect of science on television, namely the introduction of scientific items into general magazine programmes. I mentioned earlier that the 'top tenth' of the population was antipathetic to science and would not watch programmes labelled 'science'. Although the spread of a climate favourable to science throughout the population is of very great importance, the most important task of all is to modify the attitude of the top tenth.

When television began to become popular many people in this group took delight in saying that they had no television set. But that situation has largely changed, partly through the influence of the serious current affairs programmes like 'Panorama' and 'This Week', which nowadays no informed man can ignore. These intelligent programmes offer a convenient and effective way of reaching the ears of people who would not otherwise watch any science programme. The items in these programmes get their vitality from their topical nature. There is no

reason why scientific subjects should not be treated in precisely the same way. The opportunities are very great but so far have hardly been touched. If science items are to be effective they must be treated in the same adult intelligent way as the political and foreign affairs items. Because of the ignorance of the general public about science, this is very difficult. The ignorance of most television producers adds to the difficulties. The result has been that the treatment of some serious scientific subjects in these programmes has been trivial and at a level which would add weight to the commonly held belief that science has no cultural value.

Neither 'Panorama' or 'This Week' frequently include scientific items. 'Tonight' does much more and is prepared to tackle even the most complicated scientific argument either with the scientist concerned appearing, or with a professional interpreter. But the intellectual level of 'Tonight' is below that of 'Panorama' largely because it cannot afford sufficient time to develop an argument fully. There are big opportunities for developing this side of the current affairs programmes, not only in pure science, but in technology which, in spite of its obvious importance, is almost completely ignored by both television services.

I have dealt so far only with the type of programme which is designed for a mass audience. Television has an important part to play in providing more specialized information for sectors of the audience. At the moment the main sectional programmes are those devised for schools for women and for children which are transmitted at times convenient for them but not for the majority of the population.

Very shortly the B.B.C. is to transmit repeats of its science programmes on Saturday mornings. This is the first step towards a policy of adult education. In the United States this idea has been carried much further and early morning courses in physics and chemistry at quite a high level are broadcast regularly to surprisingly large audiences. This is an experiment which would be well worth trying in Britain, since there must be many people struggling with evening school courses who would welcome a helping hand from an extremely skilled teacher. Commercial television has already discovered the British public's thirst for education from the popularity of its French programme.

Schools programmes fall into a special category and as I have seen relatively few of them, I do not want to make detailed criticisms here. Those who are in charge of schools television have a unique opportunity to help overcome the shortage of science teachers by providing first-rate science lessons on the television set. But I do not believe that a television programme can ever usurp the function of the school teacher himself. One thing is lacking, the 'feedback' from the pupils to the teacher in the studio. I suppose classroom teaching is a compromise because the teacher must match his pace to the group as a whole rather than to individuals. The television teacher faces the problem of trying to teach many classes at once without any indication how his lesson is being received.

This is the disadvantage of television. But it has compensating advantages. The television set can bring people to the classroom who would not normally be able to get there. Scientists, technologists, experts of all sorts can address the schools

directly. Also demonstrations can be staged to bring to life on the television screen things which no ordinary science teacher could hope to show or explain.

So far the schools programmes have been intended to give background information. They have been designed to broaden the students' outlook and to enrich the normal school curriculum. Unfortunately a number of the programmes I have watched appeared to be inadequate and to make insufficient use of the special qualities of television. Perhaps most successful are the programmes for the senior forms of schools because they can help young people to learn something of the range of jobs open to them. Granada has been running a successful series of this sort in which some of the country's most prominent scientists have explained their research work and have shown how some questions remain still unanswered. The 'open-endedness' of scientific research is a concept still not thoroughly grasped by many intelligent adults. These scientists, I think, succeed rather well in communicating the enthusiasm and excitement of the scientific chase in subjects about which many of the pupils are unlikely to have heard before.

The big question for schools programmes is whether some more formal approach is needed. Should an actual course be prepared into which the television lessons fit? The idea is a very attractive one because it would mean that schools with poorer facilities for science teaching would be able to improve their standard greatly.

But a development of this sort would involve the Ministry of Education. At the moment there is no standard science curriculum in the schools and without it a proper television course would be impracticable. Many teachers are opposed to the idea of a curriculum imposed by the Ministry. But in our present difficulties in educating a sufficient number of scientists, technologists and technicians, I believe that the time has come to delegate certain teaching functions to the man in the television studio.

Children's science programmes are a disappointment. One would have thought that children would be particularly interested in many aspects of science. Yet the B.B.C. has almost none on its Children's Hour and the commercial network is almost as bad. Again Granada is in the forefront with an adaptation of the extremely successful American programme 'Mr. Wizard'. The programmes are mostly written by a physics lecturer at Manchester University. Quite simply a man and a child explore simple science together, using odds and ends which might be found about the house to carry out their experiments.

Almost everything I have advocated means more effort being devoted to science programmes: more scientific items in the news and current affairs programmes; more scientific programmes as part of the general evening offering, as part of Children's Hour, and for more specialized audiences early in the morning or on Saturdays or Sundays. The news services in particular need more science. Although I believe that both B.B.C. and I.T.N. have their scientific correspondents, they are rarely seen on the screen. And I am sure that more use should be made of the Eurovision link to bring information about scientific and technological developments in Europe to British screens. It is a sad thing that Eurovision should be used so little for programmes more serious than song contests and football matches.

If all these things are to be done and done well, some change in the organization

of the B.B.C. and commercial television networks will be needed. First, producers will have to be found who are keenly interested in science and want to put it on the screen. I suppose that it is not strictly necessary for these producers to have a degree in science, but it would be undoubtedly helpful to them. Although science is so specialized nowadays that a person who has graduated in physics is as ignorant as a layman about, say, biology, nevertheless a science degree gives him status in the eyes of the scientists he is having to work with. It means too that he will have some insight into the way that scientists go about their business and will be able to handle them more sympathetically. Of course there are people without scientific training who can acquire this knowledge. But I have found that usually it is easier for scientists to acquire the techniques of journalism and television than vice versa.

Although scientists are in short supply the returns from the relatively small number needed for the television services would be much greater than if they had been employed as scientists in industry.

Secondly, some kind of liaison is needed between the television services and the scientists themselves. Liaison of this kind is needed for two reasons. First, scientists become annoyed by frequent approaches, many of them very ill-informed ones, by numbers of people from the same organization. A scientist, like the rest of us, has his work to do and does not enjoy unnecessary interruptions. Yet from the point of view of the television producers the interruptions are necessary because they must find out what is going on. There is no organized news service in science and one has simply to dig around for oneself.

The same problem of liaison works in reverse. If a scientist has an idea for a programme to whom does he communicate it? Nobody knows, as so many people seem to be mixed up in one way or another with science programmes.

I believe that the time has come for the television organizations to have their own science departments to carry out this liaison work. This department would put up ideas to producers or those responsible for television news. In other words it would try to supply the missing science news service without interfering with the independence of individual producers. This organization should also regard technology as part of its province. For undoubtedly the one thing above all that is missing from television to-day is informed programmes of fact and discussion on the implications of the tremendous strides we are making in technology.

DISCUSSION

THE CHAIRMAN: Dr. Margerison emphasized the part television could play in scientific education. Another important thing which some one might care to take up is the importance of initiative coming from the scientific professions. At the present time, as I well know from long experience, nearly all the ideas come from within the service, whether it is B.B.C. or I.T.V. They should come from outside much more frequently, so that the professions take an active interest in what could and should be done and seen on the screen, and of course on the radio as well.

MR. A. POWIS BALE: I am an engineer. I found the lecture extremely interesting and valuable, and thought that it rather proved a theory of mine, that the B.B.C. programme planners have little sense of proportion. They spend enormous sums on such things as 'This is Your Life' and neglect engineering.

We have heard of a number of eminent scientists in the lecture. I believe it would be more interesting to the general public to get some famous engineers on television—men who are responsible for the practical applications of the scientific research work.

MR. DEREK FARADAY (Technical Director, Star Sound Studios Ltd.): Dr. Margerison necessarily touched on the shortcomings of some producers of science programmes. Perhaps he would enlarge on that? Also, I wonder if our lecturer has any remarks to make on the possibility that the choice of programmes which go on the air (whether from I.T.V. or B.B.C.) is to a large extent guided by the prognostications of an audience research department? An audience research department must produce figures which almost inevitably will show a preponderance of listening to what the previous speaker referred to as trivialities. Is it possible that science programmes are curtailed because of audience research figures?

THE LECTURER: I did not intend any innuendo about television producers in general. In common with educated people as a whole, the producers of general television programmes know nothing about science, and in so far as this is concerned they are no better and no worse than the rest of the population. What I do believe is that there are too few producers who know something about science, and I think that if the television organization had one or two more, then we would see rather more science programmes. As far as I know there is no one in commercial television who has any kind of science degree; no producer who could call himself a scientist gone wrong!

So far as the effect of audience research on television planning is concerned, I think that there is a difference between Commercial Television and the B.B.C. Clearly, Commercial Television must concern itself primarily with the number of viewers that it obtains, particularly during the evening period, and therefore it must fill that period with programmes which produce the maximum viewing figures. Outside that period Commercial Television seems to be quite catholic in its choice, and prepared to put on programmes which do not carry nearly as many viewers. So far as the B.B.C. is concerned, the science programmes generally attract a large audience.

In addition to finding out the number of viewers, the audience research department gets its interviewers to ask how much the programme was enjoyed. From this one obtains the figure known as appreciation index, and the appreciation index for science programmes is as high as (if not higher than) the majority of other programmes. Both the appreciation index and the number of viewers are taken into account in planning future programmes. So my view is that it is probably the shortage of producers able or willing to handle science programmes and put up scientific ideas which is the limiting factor, rather than any reluctance on the part of the planning people.

MR. PAUL ADORIAN (Associated Rediffusion Ltd.): I am a Chartered Electrical Engineer and at present I work for an independent television company. May I first congratulate the Society's Council on the fact that this is the second time that television has been made the subject of Cantor Lectures.

Coming back to the lecture we have heard: unless I misunderstood Dr. Margerison, he referred to an unduly heavy advertising of certain types of programmes which only take up a small percentage of the total time. I think he himself answered this when he referred to 'the top tenth'. Those programmes are largely meant for the upper tenth who need reminding, whereas what might be described as the 'lower eight or nine tenths' spend much more time studying programmes and finding out what is on.

I should also like to comment on what has been said on the schools television

programmes. I do not know whether the lecturer quite appreciates that two very different forms of school television programme exist. One is a type used in places like Nigeria, which consists of direct talking to the class—not very dissimilar from the first television programme film shown tonight—and which does not make full use of television as a specialized technical medium, but rather makes use of the charm and capability of the lecturer. That type of programme is very useful in schools in backward countries and also in certain parts of America where there is a shortage of teachers. But in this country television has been used in schools mainly as an aid, visual aid, to teachers and not as a complete self-contained teaching. The notes issued to teachers, with references to visual and other material, enable them to introduce and close the lectures, and this is a very important point which must not be overlooked. I would also point out that there has been primary schools physics teaching on television, which perhaps the lecturer has not been able to see.

With reference to the cost of television, I think I am not over-estimating if I say that in the current academic year, in Independent Television alone over a quarter of a million pounds will have been spent on school television, making no special allowance for all the available facilities. In other words, that is the direct expenditure. I think it is a very high one.

May I conclude by complimenting the lecturer on the complete survey he has made, which has been so very helpful.

MR. JOHN HAGGARTY: I am a script writer and film director. There are two points arising out of this admirable lecture. The lecturer said it would be much easier for scientists to acquire a journalistic television skill, than for television technicians, for example, to acquire scientific skills. I think that is true. As a script writer I am more diffident about tackling a complicated technical subject. Secondly, it seems to me that it might be a good thing if television companies would devote some of the money they make to providing a course for training scientists in television techniques as consultants to producers.

MR. J. CABOURN: I have nothing to do with television at all—I am a production manager of a book-publishing house—but there was one point made to which I take the strongest exception, namely that the ideas of television would come better from outside the television organization rather than from within it. This is putting the cart before the horse. I do not know whether Dr. Margerison agrees with me, but I feel the ideas have to be developed by the technicians who have the job of putting the thing over.

THE CHAIRMAN: This refers to something which I said and perhaps I should correct a misapprehension. Naturally, good ideas will always come from within the television service, which has attracted to it so many good people. I was saying merely that I think it a pity if *all* the ideas come from within, and that it would be beneficial if some came from the professions. I do not mean ideas concerning the technical presentation of the subject—that would be absurd, because in the main the technique is still a mystique, known within and not without—but the more general ideas of what, looking into the future, is likely to be important. The B.B.C. was not advised, for example, that it should look to space travel as an outstanding subject in the next ten years. These ideas should have come from scientists and not from within the B.B.C. It should be possible to have an advice service on ideas as well as on individual aspects of different subjects. That was really the nature of my plea.

THE LECTURER: I agree and I disagree with our Chairman. I agree that it would be a splendid thing to have a mechanism whereby ideas come from outside and find their way to the correct quarter inside the broadcasting organization, but I do not agree that scientists should have informed the B.B.C. or Commercial Television or anyone else that they ought to be watching space research, because

I think the B.B.C. ought to have sufficient perspicacity to know that space research is something which they should be watching. In other words, I think that we have got to have some mechanism whereby the B.B.C. has its own internal advisers; and the same thing applies (although it is probably more difficult to organize) to Commercial Television.

MR. J. BRIAN RICHARDSON (Chiswick Polytechnic): As an arts teacher in a technical college I should like to challenge one of Dr. Margerison's remarks. I am not so sure that 'the top tenth' are as uninterested or unaware of scientific problems as he suggests. I think for one thing that the techniques of research in the arts generally have become so much more scientific over the last ten or twenty years that those of us on the arts side are more aware of the mentality and the approach to research of the scientist.

What really puzzles me is the problem of putting over, on a large scale in the educational sphere, the techniques of science. It is obvious that there is a tremendous opportunity here to meet this dreadful lack of science teachers. I should like to ask Dr. Margerison whether the B.B.C. or any other television authority has made any attempt to surmount this problem of feed-back from the child audience by trying to co-operate with the Ministry of Education, or perhaps independent schools—to use a live audience in the television science programmes which would probably ask most of the questions which one might have anticipated from the various schools using them. What sort of chance does he think there is for that?

MR. NORTON: I speak as a governor of an independent school. I have for some time been urging the staffs of private schools to make more use of the television programmes for schools, but I meet a very great deal of resistance to this because the staffs say (and I think it is a fair criticism) that the programmes are so far removed from their normal work. In the treatment of science the danger surely is trying to make science 'news'. A few moments ago Dr. Margerison referred to the necessity of following space research. There is a lot of science which is not space research but which is yet very important. I certainly agree with the teacher that there is an excellent opportunity for getting feed-back from schools.

I wonder if I may close with a question to Mr. Adorian. I think he must, on his sense of scale, have left out a nought in being so pleased that £250,000 is being spent on educational programmes. I wonder if he could interpret that in terms of minutes of Commercial Television revenue, so that we can get it in scale. (I suspect it is rather a small amount.)

THE LECTURER: The idea of having a live audience for schools programmes to give the person conducting the programme an immediate feel of what is going on, is a novel one, but it would add very little to the value of the programme in that the real disadvantage is that you are blanketing an audience consisting of every school in the country taking this particular programme. Each form will have a slightly different background because it will have followed a different curriculum and it will have had a different teacher with more or less interest in certain aspects of science. The major difficulty in anything other than the background type of programme is that you are having to take into account this very large number of diverse backgrounds and therefore you cannot do as much as you could if you were working with a single form.

The next speaker says he objects to the attitude that all science must be news. This is an attitude that I also object to very strongly. There are certain pieces of science that can be put over in the newsish way. They have a certain topical value. For example, in a week or two's time Professor Andoin Dollfus is going to go to have a look at Venus in a balloon, and I think that his flight, on the day that he makes it, is a perfectly good piece of news and also one that can be used as an excuse for putting over a lot of background information about balloon flights or about looking

at Venus. You must not underestimate the power of topicality in drawing people's attention to things that they would not otherwise read.

On the other hand there is no excuse at all for trying to make all science on television, or even a large part of it, topical, because the fact of the matter is that science is by its nature very untopical, and there is no reason why you should write about it on one day or week or month rather than another. So if I have given the impression that I am very keen that all science on television should be connected with topical events I have given you the wrong impression.

MR. ADORIAN: I was asked to interpret my figure for the amount of expenditure on school television. Well, let me say that it is infinitely higher than the revenue earned by school television, as there is no advertising associated with any school television programme.

MR. JOHN GILBERT (Head of Department of Electronics and Telecommunications, Northern Polytechnic): I have, as a result of my position, been associated with television right from its earliest days. There was once a B.B.C. programme called 'Inventor's Club', which brought during its 100 programmes a great amount of interest to the average man in the street. It never claimed to be a scientific programme, but it did cause two people, Mr. Geoffrey Boumphrey and myself, to learn a lot about science in order to put the programme over!

Now I should like to comment on television and science programmes. I have always felt that this type of programme is not always suitable for production in the studios, and last year I asked one of the major Independent Television companies (Associated TeleVision) if they would consider a series of programmes on life in a technical college and extracts from lectures. I was fortunate in convincing them of the importance of the masses seeing a technical college at work, and after the first programme the series was networked to most commercial transmitters. It was a live transmission and lasted three-quarters of an hour without any interruptions; nor was there any advertising before, during, or after the programme. Stephen Wade, the producer, and I organized the general pattern of each programme and we asked the Head of each department to describe and show some of the experimental work in the department. Each programme opened with a brief interview and then the mobile cameras were moved from laboratory to laboratory. Each Head of the various departments, covering Architecture, Physics, Chemistry, Domestic Science and Telecommunications, enjoyed the opportunity of showing the public the facilities and opportunities available in their departments.

Because these transmissions took place during Polytechnic time, we felt that we could not ask for a fee; but I did agree with the Company that the appropriate fee took the form of a scholarship, which will last for many years and which is a far greater achievement than anything which we personally could have received.

Now may I comment about feed-back, for there is such a system in schools television. When Associated Rediffusion started programmes for schools, I was asked if I would join their Council in an advisory capacity. It took a little time for schools to take these programmes; but gradually and then more rapidly they started taking them, and after the first term we obtained a considerable amount of information back from the teachers. Teachers were requested to fill in a questionnaire form and their comments were most informative and, to a certain extent, gave the Council a very good idea as to the requirements for future programmes. I think that this form of feed-back is extremely valuable, for it benefits everyone, the programme company, its production staff, the teacher, and—of far greater importance—the student.

MR. GEORGE DOUGALL: I am a B.B.C. Overseas Producer. I wonder whether the Ministry of Science could build this bridge or liaison between producer and scientist

and I also wonder whether one could inject the human element into science programmes. Programmes such as 'Emergency Ward 10' are popular because they have a human element. One might produce a series about a family who are scientific and react to everyday things around them. That would be a programme which could be seen at peak hours by everybody for its associated entertainment.

THE LECTURER: One of the difficulties of this idea is that, in my experience, scientists all lead such blameless lives that there would be no audience at all!

The Chairman then proposed a vote of thanks to the Lecturer, which was carried with acclamation, and the meeting ended.

II. THE PRESENTATION OF THE VISUAL ARTS

by

BASIL TAYLOR

Reader in General Studies and Librarian, Royal College of Art, delivered on Monday, 8th May, 1961, with Nevile Wallis, Art Critic of The Observer, *in the Chair*

THE CHAIRMAN: No one could be better qualified to address this meeting now than Mr. Basil Taylor. He joined the B.B.C. soon after the war as one of those responsible for Talks broadcasting in the Third Programme and particularly for material on the visual arts. More recently he has been associated with television, and with a wide variety of programmes on art and architecture.

The cast of his critical mind, which I would define as an intellectual wrestling with his subject fortified by art historical scholarship, has made him our first authority on George Stubbs. His survey this evening will, I hope, embrace other visual arts besides painting and sculpture, including architecture.

Mr. Taylor has many preoccupations at present and our Society is particularly grateful to him for appearing this evening. I will keep you no longer from him, and now happily invite him to address us on a subject of first-rate interest, and of concern to us all.

The following lecture, which was illustrated with television films, was then delivered.

THE LECTURE

I must begin by indicating what I shall understand by the term visual arts in the context of this lecture. Begging a number of questions, I shall mean thereby not only painting and sculpture but architecture, industrial and graphic design and the crafts. And I shall treat these various arts under two heads, for, begging even more questions, I shall call architecture, industrial design and graphic design social arts, painting and sculpture the personal arts. This distinction is not made without the recognition that a painting or a sculpture may find its place in a public setting and symbolize some collective ideal or attitude, but in the belief that our individual response even to such works is an extremely personal one. I use this distinction not only because it is valid in this sense but also in order from the start to distinguish between two distinct responsibilities not only of television but of all the mass media. In the one field television has a social responsibility whether it chooses to act upon it or not; in the other it is a matter of satisfying personal wishes and enthusiasms.

As to the medium of television in itself, I must, I suppose, begin by restating a platitude even if the intention is later to examine it somewhat sceptically. Television, it is said, is a visual medium and therefore an ideal vehicle for the visual arts. For these it can perform the same kind of service as sound radio and the gramophone has for music. While the basis of this argument cannot be challenged, it is most important to recognize and define the limitations of television in the communication of the visual arts, perhaps more important to do that than to be demanding and optimistic about its use in the future.

It is not the purpose of this group of lectures to consider the governing control of the medium, the political, social and moral implications of the present pattern of control or to argue for or against commercially-sponsored as distinct from independent television. In the choice of my last few words I have sufficiently declared my own view of the matter. But it is necessary from the start at least to touch the edge of this large question, especially for anyone concerned with this particular thesis.

This country is not even to the extent to which it has become a musical nation, devoted to the visual arts, nor has it been outstandingly distinguished in the production of them. In a hundred years only one artist, Henry Moore, has achieved an important international reputation and even that has not been a seminal one. English intellectuals, let alone anyone else, are peculiarly unresponsive to painting and sculpture and just as unresponsive to architecture, if it is less than fifty years old. In a newspaper office or the senior common room of a university college—and by that token in the departments of television administration and programme planning—it would be surprising to find anyone with a strong interest in the visual arts, rarer to find anyone whose interest was supported by up-to-date knowledge and ardent experience, and rarest to find anyone inclined to take action in furtherance of his interests. When all due attention has been paid to the fact of more populous museums and exhibitions, the increased sale of art books, the sketching holidays and other things to which the optimist might point, there is still a very large majority, even of those who have been educated beyond the age of fifteen, who have not any significant contact with the visual arts, as so many have with music. The visual arts do not figure among their pleasures let alone belong more seriously to their intellectual and imaginative lives. Nor do the visual arts inspire that kind of curiosity which is engendered in most people—at least from time to time—by science and politics.

Because there is no pressing and commercially exploitable appetite for the visual arts we need within the television services one at least of two conditions—either a sense of public service not too sensitive to the size of the audience to be satisfied or some fanatical individuals. The first will have ultimately to depend upon the second and the second will be frustrated without the first. Let me put it differently and without disguise. If the purpose of television is to entertain as many people as possible at the same time in the manner the large majority enjoy so that the greatest possible audience can be subjected to advertising, if the main consideration is to keep the sets turned on and fixed to one channel, if the ambition is to make the organization an annexe to the Bank of England and the Mint, then there can be few better ways to defeat such purposes than the presentation of programmes on the visual arts.

Because the history of the television treatment of such tends to support this view, I should like to examine it in general terms before coming to a separate consideration of its relationship first to the social and then to the personal arts.

As I was not a viewer in the 1930s I will only speak of the period since the war and even for that period I must ask you to accept certain generalizations, because the detailed factual support of them would occupy too much time on such

an occasion. Since 1947 the amount of time devoted to the treatment of the visual arts has diminished absolutely, and quite remarkably diminished relative to the total hours of transmission within a period of a week or a month. In 1948, when the B.B.C. provided programmes for approximately sixty hours a month, about one hour of that time was devoted to the visual arts. To-day there are approximately 200 hours of television on any channel in a month, and in that period one does not expect to find more than one hour devoted to the visual arts. This means, and it is not, I believe, accidental, that the proportion of time has decreased as the audience has enlarged. And it is unhappily ironical that the increased audience includes relatively more of those seriously interested in the visual arts than possessed television receivers in the 1940s. Another fact which clearly emerges from an examination of the evidence is that the decline accompanied the acceptance and development of Commercial Television.

The beginning of 'Monitor' in 1958 was an important occurrence in the history of this particular matter, but valuable and successful as this programme has been, it may be used to illustrate another unfortunate trend. In the 1940s visual art subjects were almost invariably treated in free-standing items. To-day, and on the B.B.C. channel in particular, such a situation is almost unknown and visual art material is almost invariably incorporated in programmes with a wider scope. Two instances will illustrate this tendency very well. 1948 was the centenary of the formation of the PreRaphaelite Brotherhood, the occasion for a modest exhibition at the Whitechapel Gallery. These artists were celebrated by a separate B.B.C. programme of half an hour's duration. In 1960, I need not remind you, London had the most widely publicized and the most successful exhibition in its recent history, the Picasso show at the Tate Gallery. This did not occasion a separate programme, as it well might have done as a response not only to the status of the artist but to public interest; it simply provided items for 'Monitor' and 'Tonight'. It is true that John Read's B.B.C. art films and the programmes introduced by Sir Kenneth Clark on commercial television have commanded space of their own, but both, and in particular the latter, are conceived in terms of prestige and special favour. It is characteristic of the I.T.A. series that they should be presented and advertised (and used subsequently in the extensive advertising campaign now being indulged in by the commercial networks) not in terms of their content but of the well-known publicist who is responsible for them. Art equals Sir Kenneth Clark as it would seem the heavens equal Mr. Patrick Moore.

I will now consider the treatment in television first of the social and then of the personal arts. And in the case of the former I think it is proper, although perhaps not fashionable as it would have been in broadcasting thirty years ago, to speak of television's responsibility.

The architect not only serves the elementary material needs of man in society but places before us concrete images of what society, and life in modern society, might become. The projects of Le Corbusier in the '20s, for example, were attempts to find physical solutions to some of the problems posed by the social and technological conditions of the twentieth century. The industrial designer can do the same thing on a lesser scale, and the graphic designer is not only increasingly

the means by which ideas and policies are communicated, but can significantly influence the form of the message. In all these social services the social artists have an importance which may be hardly less than the scientist or the politician. Our Health Service, for example, must to a great extent depend for its efficiency and humanity upon the ingenuity, skill and sensibility of the architects and designers who put its policies into physical terms. So if it is thought that television has a responsibility to give a widely accessible explanation of scientific achievement and method and to put the issues of the day before the voter in a democratic society, then it has surely no less a responsibility to present to the lay public the social activity of the architect and designer and identify the nature of these professions. It is no exaggeration to say that so far nothing of any consequence has been done for the social arts. And here I will quote from the evidence submitted by the Royal Institute of British Architects to the Pilkington Committee.

> The reconstruction of large parts of our existing towns and cities to make them function efficiently, and to provide an environment for a good life is possibly the greatest single domestic task facing the British people in the next 40 years. Yet the public is only dimly aware of this fact.
>
> The advancement of architecture and raising the quality of the whole physical environment are severely handicapped by this widespread ignorance and indifference. All experience shows that good architecture, whether on the scale of the individual house or a design for a new town, depends to a large degree upon a sympathetic and understanding public. The R.I.B.A. is convinced that if the nation is to succeed in the challenging task of banishing ugliness, inconvenience and inefficiency from our towns and cities its architects need an informed and critical public opinion, not merely to support architects but to criticise them intelligently, and above all to demand something far better than people are now prepared to accept. There is no more powerful medium than television for creating this informed and critical public.

I will press the general point no further than that, but illustrate it by mentioning a recent item in 'Panorama' given to the work of the architect Denys Lasdun. This was an interesting and skilful presentation of one man's work, but behind the theme pursued and Lasdun's own statements lay necessarily undeveloped and unexplained the whole modern movement in architecture and planning, its ideologies, its social purposes, its technology and attitude to style as well as its aesthetics. This is what remains so far unrevealed—and I am not forgetting the B.B.C. programmes made in association with the Civic Trust or even Mr. Reyner Banham's recent series on I.T.V. and certain *ad hoc* items on 'Tonight' and 'This Week'. But behind these individual and separated instances there has clearly been none of the kind of purposive thinking and planning which one would guess has produced the wide range of scientific and medical and psychological programmes which have appeared on the B.B.C. channel in particular in recent years. The first task in this sphere is to do at least as much in the way of public understanding for Le Corbusier, Gropius, Wright and the rest of the seminal minds of twentieth-century architecture, planning and design as has already been done for Einstein, Darwin and Freud. And it should be said that whereas the existing journalistic channels are more than adequate to project the achievements of the latter—in addition to the general dailies and weeklies we have publications such

as the *New Scientist* and other middle-brow periodicals—for architecture and the other visual arts there is no such channel of communication.

If that is one specific task, another, in this architecturally parochial and hesitant island, would be to extend our horizons, to develop the appetites and demands of the public by a fraction perhaps, by making them aware of what experiments and accomplishment have been and are being made elsewhere. A great deal of money is spent transporting us to New Guinea or Madagascar or the Galapagos and at the end of it all we have, however delightful it may be, is a dragon, a lemur, a finch and Mr. David Attenborough's infectious enthusiasm. I wish that some money could be spent in taking us to places—Saarinen's General Motors Research Centre, for example, or Le Corbusier's Ronchamp—no less remarkable and exciting and certainly in human terms more important. Some years ago, it is true, the television cameras did occasionally take us into famous buildings, but typically enough none of them, I believe, was less than 300 years old.

There is surely more than enough going on in architecture here and abroad to fill to a large overflow a monthly programme of report, comment, discussion and visual pleasure—as a programme such as 'Gallery' does for the often monotonous if necessary current of politics. One of the phenomena of the last ten years has been the increasingly positive interest in the products which serve modern life, from liners, aircraft and cars to cutlery. The interrelation of invention, technology and design is changing the nature and appearance of so much that we use, and to an unprecedented extent. And if television has done little about architecture it has done even less to reflect this condition of modern life, and in this failure has seriously underrated the curiosity and concern of a significant body of people. Treatment of these social arts, therefore, seems to me a service which it is proper to require. It will be the challenging task of those who may decide to undertake this service to make the fulfilment of it something entertaining, a stimulus to the eye and the mind and the imagination, for it is both a depressing and a timorous response to such a challenge to equate service, and indeed public education, with boredom. I have heard other objections more practical to the fulfilment of such a policy and to these I will return later in this lecture.

What I have called the personal arts have always been somewhat better served in television, although I must remind you that an increase in the audience, improvement in facilities and in technical possibilities have been accompanied by a certain narrowing of ambition and certainly by a diminished sense of experiment and purpose. Looking back again to the late '40s one finds, to take a few examples, the attempt to provide a monthly review of exhibitions, programmes in which art films such as those on Michelangelo, Van Gogh and Matisse were combined with a studio treatment of these artists, studies of individual pictures (similar to the present 'Picture of the Month' on sound radio), on the nature of drawing and on other matters of technique and craftsmanship, the painting of a portrait before the cameras. Some of these programmes would no doubt have a primitive look to-day, but they possessed certain virtues which seem to be missing now. They occurred regularly, naturally and independently in the current of the programmes.

They were constantly testing the capabilities of the medium. Equally they did not hesitate to stretch the sympathy and experience of the viewer.

What has happened in the last few years? The commercial channel has depended primarily upon the name and skill of Sir Kenneth Clark. The programmes which have resulted have been efficiently made without a remarkably imaginative use of the medium, have kept within the boundaries of the speaker's own particular capabilities and—as in the recent series on landscape—have often done little more than translate earlier writings or observations into the medium. When these series have been mentioned, together with some dogged outside broadcasting from exhibitions transmitted in the afternoons, there is not much more to remember. As one would expect, the B.B.C.'s record has been more if not greatly impressive; their output of visual art programmes having rested mainly upon two achievements—the art films of John Read and 'Monitor'.

Mr. Read's films have in the first place sensitively and properly exploited what, as I want to show later, is a characteristic of the television medium—like the film medium. They have presented art not through an eloquent transmission of the work but through the identity of the individual artist, and by watching his response to the world in which he lives as well as by enabling his words to occur in the context of his work and his actions. Above all they stimulate our respect for a Henry Moore or a Lowry or a Spencer and stimulate our curiosity. I do not intend any criticism of the director of these films or any lack of gratitude for his work when I say that these films have been prestige items and all the more special by reason of their finish, the skill and care with which they have been made. Such things should always have their place in the programmes.

The items in 'Monitor', although no doubt often made more rapidly, have had a similar character. They are special, highly premeditated items conforming quite narrowly, in spite of their variety of subject, to the spirit which pervades the programme as a whole. Although the items sometimes relate to current topics and talking points, they tend to extricate and isolate the material from its bed, to be crystals picked from the rock, cut, polished and elegantly set. Perhaps I can convey their nature best if I compare them, and indeed the programme as a whole, with the Swiss art magazine *Du* which, like 'Monitor', has such a strong identity—the identity of very high class and sophisticated journalism. Even when the art presented belongs to that current of the moment it seems to have been specially incapsulated. There is a sense in which Read's films as well as 'Monitor' gain force from having the identity which they possess. But they would give greater service in the communication of the visual arts I believe, if they did not stand practically alone, if television regularly presented a more immediate, even rough and ready response to the flux of the arts.

Programmes such as 'Tonight', 'Panorama' (in the past) and 'This Week' have brought the visual arts within their scope. What they have lacked in this regard is editorial perceptiveness and authority and this has led to a hesitant, uninformed, sometimes apologetic and often insufficient treatment of visual art subjects. While having enormous technical advantages they have seldom done the matter better or more responsibly than the popular press.

So far as I have assumed that a television set really is what 'Panorama' claims to be—'A Window on the World'—but of course it is not and cannot be a window giving upon a work of art, simply a transparent pane through which we observe, as in normal experience, paintings, sculptures and buildings, visible in and for themselves. Those lines upon the screen even when, some time in the future, they acquire colour can never be shaped into the works which anyone of us has access to as individual spectators. They become a special kind of image projected into the very special situation of television viewing. What then can the television screen communicate with respect to the visual arts?

It cannot bring into our room even an equivalent of a coloured reproduction. The image it presents must always be an active thing absolutely involved in a temporal sequence. We cannot continue to look at or turn way from the image in a state of repose or concentration as we can with the real thing because we know that it is in somebody else's possession. We must banish the thought that the television set can become a kind of museum or private collection or substitute for ownership, and those who feel that the general experience of works of art has degenerated in our time through a surfeit of casual 'viewing' might reasonably regard television as an enemy of artistic apprehension.

Those who question the possibility of using television in the service of the social arts—this is one of the objections I referred to earlier—will say rightly that we lose not only scale but the pressure of space, the relationship between space and mass, solid and void, upon which the expressiveness of a building so largely depends. But it is possible to achieve very worthy results if the method is right and the right method for architecture is also, as I want to show, essentially the right method for the other visual arts. An example of this occurred in Dr. Bronowski's recent series for the B.B.C., although I doubt if the effect was deliberately planned. The sequence in question concerned Saarinen's new air terminal building for T.W.A. at Idlewild, and although the structure or a model of it was never carefully explored by the camera, the sequence of shots, including as it did the conversation between Bronowski and the architect as well as the context of ideas within which the consideration of the building was set, combined to give an intense if quite indirect sense of the building's character.

The image on the television screen then does not so much present as argue, because, as in the film, we know that one shot is going to be succeeded by another. We watch with suspense as we listen to music with suspense, and as soon as the change of image takes place an argumentative situation has been created. This is the process in which the work of art must necessarily get itself involved on television and this is the process which has inevitably to be used. But if the screen cannot to any degree simply and satisfactorily present things for study, contemplation, undisturbed and passive enjoyment, it can do other things most usefully. It can draw attention dramatically to what exists—there was an artist called Daumier of this kind, there is an exhibition of his work on at the moment—and in so doing it can stimulate, if never hope to satisfy, curiosity. It can, by reason of its argumentative utterance disturb our fixed ideas and enlarge our tolerances. Better than any other medium of communication it can get works of art healthily

mixed up with other human products and activities, preferably not by any deliberate act of combination tempting in an age when so many people are trying to form 'common cultures' and unities of art and science, but simply by letting things rub against each other.

The television image can effectively answer questions like, how did this work come to be made? What kind of a man made it? What are or were his ideas and intentions? What were the methods used? Those who believe that in the appreciation of the arts the only thing that matters is the private act of undisturbed communion between individual and work, that nothing else can contribute to our understanding and enjoyment, those who adopt this puritanical attitude will get nothing from their set.

I will end by suggesting some aims and goals. Inevitably I must believe that the ideas and opinions and concerns of those devoted to the visual arts should be given more time and attention, not just in programmes immediately about their activities but in those which reflect more generally the life of our time. It is perhaps to be expected in a country where the visual arts are taken seriously by so few intellectuals that the voices of architects and designers, painters and sculptors should contribute so little to the flow of comment which pours out of our radio and television sets, that a programme like the Brains Trust has hardly ever presented the artist although we apparently cannot have enough of some minor lady poet or retired philosopher. When they do come before us, in whatever context, we may also ask that they should be treated not as curiosities to be approached with a special voice and face, marked by superstitious awe or disdain. Anyone who is concerned with this sphere of life knows only too well the special gestures and tones which greet the appearance of the artist or the work of art—jocularity, nervousness, protestations of ignorance, sniggers of embarrassment or distrust. Whether it be Pasmore or Annigoni there is nothing to be said for treating either of them in special terms of reverence or scepticism.

From this follows the need to treat the arts not as something in capital letters or between inverted commas but as part of the flux of events. This means that they should be treated with a certain relaxation and naturalness and not brought forward with feverish expectation, as is apparently necessary in the presentation of 'pop' singers. One of the expected ill effects of the competition between the commercial and independent channels is that every programme nowadays has to be sold to us, offered as if it was a special and major occasion, just as every biscuit or cigarette has to come not as something to eat or smoke but as an enormous beneficence graciously bestowed. It has been one of the excellences of the programme 'Tonight' that matters can be presented there both with a proper respect for their importance—I am not speaking of the visual arts—but also as part as the natural current of things. The activity of a Picasso or a Le Corbusier, or a Sir Kenneth Clark is not a privilege but a fact.

And I would reaffirm my conviction that television's primary responsibility in the immediate future is to stimulate and guide public response to the social arts—which brings me to some final words on means and methods. If a sense of responsibility towards the visual arts is to be maintained within any broadcasting

organization then there must be at an appropriate level an informed and enthusiastic editorial direction, knowing what is significant and immediate within, in touch with the most important points of activity and growth. There is the need in this sphere particularly for opportunity to experiment in presentation, production, means of projection, experiment conducted away from the pressures of urgent programme commitment. It is true that the architect or the designer is not always the best presenter of his own skills and concerns and products. If we are asking for certain action upon the part of television, we must equally ask for action, ideas, co-operation and understanding on the part of professional bodies such as the R.I.B.A. There is the need for individuals, the go-betweens, particularly in the sphere of the social arts, those who can with authority, judgement and enthusiasm provide the link between the material and the public. They have to be found certainly, but also to be trained through experience. and such experience is what television has so far offered so sparingly.

DISCUSSION

THE CHAIRMAN: I am sure all those present must feel that this whole debatable subject has been probed and examined with authority. Mr. Taylor has rightly drawn attention to programme limitations, and possibilities yet unexplored in this field.

But it is an absorbing experience to be involved. I was very conscious myself, the other afternoon at the B.B.C. Studios, interviewing the sculptor Ghisha Koenig on her new Crucifixion reredos, of the tremendous advantage of commenting on details of her sculptural relief as the camera explored them. The monitored image became in every sense a moving image—the figures really seemed to move. Deprived of that technique, my illustrated piece on Ghisha Koenig's sculpture, previously published in a Sunday newspaper, seemed somehow incomplete, lacking a necessary dimension.

SIR ERNEST GOODALE, C.B.E., M.C. (a Vice-President of the Society): Mr. Taylor observed that the R.I.B.A. and other similar bodies would have to go half way to meet the producer in order to get the best results. We in industry have recently had a similar experience in trying to get the B.B.C. to put over on television and sound broadcasting the current achievements in British industry. In considering how this might best be done a number of industrialists have recently undergone a short period of instruction as to how to appear on television. One of the difficulties encountered was the rather severe cross-examining through which some of the interviewers tend to put inexperienced people.

The instructor who was briefing us said in the end that it was, after all, supposed to be entertainment. It seems to me that that is a fundamental problem in this matter. I think that the primary purpose of the B.B.C., and I.T.V., is to entertain, not necessarily to inform or to educate. There is a point here on which Mr. Taylor might like to enlarge.

THE LECTURER: I think that all the visual arts (and architecture, perhaps, in particular) can do is to present their own particular problems, and they are ones which in a sense television alone, or television producers, cannot themselves answer. They need and always will need, like people working in any other channel of communication, professional advice, help and co-operation. I think that is why any professional body has a duty, if it is demanding the right to the channel of communication, to undertake on its side the consideration of what that medium demands both in itself and with regard to their profession.

I don't think one ought to regard television or sound broadcasting at present as primarily an educational organ, although the B.B.C. Charter certainly includes responsibility of an educational kind. Somehow the spirit of incidental, let alone central, educational service has to a great extent declined. I do not think that there is now the same kind of approach to the visual arts as there was in the past to the propagation of music. But while the producer in question may not have meant it in these terms, simply because television is a medium concerned with entertainment as well as with the dissemination of information, instruction must be made entertaining; if it is not, it will suffer by comparison with the other elements of television or sound broadcasting. This seems to me the great problem posed by the particular media of broadcasting—that they have such an enormous range of function, and inevitably the various functions must influence one another.

MR. MICHAEL FARR (Council of Industrial Design): Reference was made to organizations which can help television companies to present their case. We at the Council of Industrial Design have been very fortunate. The independent companies and the B.B.C. have been kind to us in coming to investigate the sort of work we have on show at The Design Centre and discussing various ways in which it could be presented. The difficulty is that here we are not dealing with personal artists, but with manufactured products with trade names attached. We should like an opportunity of working in closer collaboration with programme producers, who are not looking just for entertainment but who see in The Design Centre material of real public interest and concern. What does Mr. Taylor feel about the presentation of the very few programmes there have been on design, and how might they be made to interest people more profoundly?

THE LECTURER: The trouble with presenting objects of industrial design is that one very quickly finds oneself involved in matters of judgement. Obviously it is one of the main responsibilities of the Council of Industrial Design to try to establish standards, but I think it would be a mistake if television were to regard what they were doing primarily as a matter of establishing design standards. Design standards are probably better dealt with through the very material which they themselves use. I do not feel that the approach here should be one of trying to improve or to influence people's taste, but of stimulating interest in the very nature of the things which are becoming available in this country, and abroad as well. I am sure that anyone who attended Mr. Charles Eames's lectures at the Royal College of Art a year or two ago will have been stimulated by simply listening to an industrial designer thinking aloud.

MR. CHRISTOPHER BRUNEL: I feel that the tendency is to separate education and entertainment, with perhaps a slight tendency to decry the latter. The speaker himself has pointed to the importance of marrying education with television in such a way as to make it entertaining. The programme 'Monitor' gives a wonderful illustration of how that is done, particularly as Mr. Weldon in that programme does not adopt the hectoring methods that some other commentators in the political field do towards their subjects.

Referring to the political field, I think one does see that the politicians, especially at the time of a general election, feel it essential for their own purposes to study the techniques of television. Artists, however, don't do the same; they leave it entirely to the art critics to study these techniques. I feel that very much more could be done by artists themselves in studying the techniques of television—finding out what its limitations and strong points are.

THE CHAIRMAN: Before Mr. Taylor answers, I should say that the question must surely be whether the artist knows he may be called upon. The number of artists

who are called upon in the course of a year to speak about their art, are very few, are they not, Mr. Taylor?

THE LECTURER: Yes. I want to make the distinction here between the presentation of the work itself and all that surrounds the making of the work of art. I do not feel that the artist can look to television as primarily a means of exhibition. He may regard it as a means of publicity, but I do not think that television is a matter of concern to him in terms of presentation unless he happens to involve himself quite directly in television production. Therefore I do not think there is the impulse to consider television in this sense as a means of communication.

On the other hand I think that there are many artists, designers and architects in this country who have a contribution to make in terms of forming general opinion and ideas. As Mr. John Read's films show, quite a number of artists have found themselves being presented through film, and I am sure he has had varying experiences of their readiness to co-operate in order to produce a result which is satisfactory. For the individual artist, particularly for the painter and sculptor, television must seem a rather double-headed creature—on the one hand able to communicate the things which are of value, and on the other unable to communicate the essence of what he himself is doing directly and for itself.

THE CHAIRMAN: It has been said that certain faces are perhaps too familiar on television, and maybe certain commentators tend to recur. Would you say that was also true of certain distinguished artists? I myself cannot see too much of Henry Moore or Graham Sutherland. Do you think that younger artists could be called upon more often?

THE LECTURER: I think this again is really a matter of creating the framework. In relation to, say, the production of a newspaper or a magazine, television is a cumbersome operation, and one of the few ways in which people or things can pass through the machinery and come out relatively intact at the other end is if there exist certain frameworks into which they can be fitted. A programme like 'Tonight' is a framework into which certain individuals or subjects can be fitted at very short notice. 'Monitor' is another framework into which items of a particular kind can be fitted.

The trouble as far as artists other than those of considerable fame or notoriety are concerned is that at the moment on neither channel is there the sort of framework, aside from 'Tonight', in which these individuals can make an appearance. They do make an appearance from time to time on 'Tonight', where they often get a rather unsympathetic treatment. This is not necessarily deliberate. There is not, I think, within that particular programme a sufficient measure of what I would call editorial authority to enable the visual arts to be dealt with effectively, which is why I feel that there is room for a continuing programme which will treat the visual arts with such understanding and sympathy.

THE CHAIRMAN: I entirely agree.

MR. JOHN READ (B.B.C. TV Film Studios): I am a producer. I should like to ask Mr. Taylor whether he thinks the use of colour television in the future will have any beneficial effects on art programmes?

THE CHAIRMAN: A vital question.

THE LECTURER: Obviously colour will tend to make the visual arts apparently more attractive; that is to say that it will bring the level of interest in the image of the picture, or whatever it may be, up to the level of the interest in other things. The picture suffers at the moment from the fact that it does not have the vital element of sheer visual appeal. At present any form of dramatic performance, any performance which depends upon motion, is inevitably more appealing on television than any-

thing which is static, and therefore in television programmes an attempt has to be made to make the image dynamic.

I don't really think, however, that colour will alter this relationship between the image itself and the thing itself; I don't think it will make the experience of works of art via the television screen any more powerful or immediate. I don't think we shall be able to look at the picture any longer without a sense of unease, even if it is in colour. I think we shall still have to use the work of art as an element in some kind of argument and not for itself, and that seems to me to be the essence of the television method as far as the visual arts are concerned.

THE CHAIRMAN: This has been a stimulating occasion for all of us. Mr. Taylor has indeed made a significant contribution to the Society's proceedings. He has shown to an inquiring audience that there is no room for complacency about the presentation of visual arts programmes.

The time devoted to them has dwindled, as he has said, since the 1940s. They have become rarified items, warily handled and divorced from the mainstream of human activities.

Not long ago, opening an exhibition at Cambridge, I remember suggesting that what was really needed was a commentator with something of the learning of Sir Kenneth Clark combined with the forthrightness of a Harding, and a warmth of humanity—a character to make Modern Art a talking point wherever two or three are gathered together in the new balconied flats. Maybe the fault lies partly in our too civilized utterances. Partly also, perhaps, in over-vetted and rigged rehearsals, smoothed for particular audiences. It might be no bad thing if one night the pundit were to forget his cue and improvise from the heart. But the thoughts that occur to me are almost unending, and we are grateful indeed to Mr. Taylor for provoking so many.

Now I should like to propose a warm vote of thanks to him, and ask you to endorse it in the usual way.

The vote of thanks to the Lecturer was carried with acclamation and, another having been accorded to the Chairman upon the proposal of Sir Ernest Goodale, a Vice-President of the Society, the meeting then ended.

III. THE PRESENTATION OF MUSIC

by

LIONEL SALTER, M.A., Mus.B., L.R.A.M., Head of Music Productions, B.B.C. Television, delivered on Monday, 15th May, 1961, with William Alwyn, F.R.A.M., formerly Professor of Composition, Royal Academy of Music, in the Chair

THE CHAIRMAN: Mr. Lionel Salter is one of those rare beings, a fully trained musician and an extremely competent executive officer. As Head of Music Productions at B.B.C. Television he has already made a number of changes and improvements, and I think that if he has his head he will revolutionize the production of music on television.

The following lecture, which was illustrated with television films, was then delivered.

THE LECTURE

The presentation on television of science and the visual arts—the subjects of the two previous lectures in this series—may indeed be fraught with problems, but, at least, few thinking people would deny the validity of their appearance on the screen. With music, however, even this is by no means the case. You can demonstrate scientific experiments in the television studio, show films or actual live broadcasts of natural phenomena, and with the aid of skilled commentators, use of models and so on greatly help to spread a knowledge and understanding of scientific principles and advances. The visual arts—despite the fact that the present enforced absence of colour denies them one important element—are obviously a 'natural' for the television medium. But music, being an abstract art, is another matter altogether. I should perhaps make it clear that by 'music' in the context of this talk I do not mean the kind of material which exists mainly as a vehicle for some personality in the field of entertainment, but what is usually called 'good' or 'serious' music—though both of these are unsatisfactory terms; what is intended is (if I may venture the definition) music of intrinsic quality in which the composer is artistically more important than the interpreter. I am not even, for the moment, referring to opera, which would appear to be the most 'visual' form of music: for opera is really an amalgam of various dramatic arts, although music is the decisive factor in it. Indeed it could be claimed that no opera with poor music could hope to survive, were it not that certain contemporary stage works seem to be challenging this tenet. The early Florentines, who invented opera, put it admirably in calling their creation *dramma per musica*, i.e., a drama not with, but through, or expressed in, music.

Music has certain special features which set it apart from other arts. Whereas it is possible to gaze at a painting or a piece of sculpture for as long as one pleases, music is a temporal art—that is to say, it is continuously unfolded in time, and any enforced lingering or stopping promptly destroys its vital flow. What is

more, instead of being, like a book or a picture, at once assimilable through the sight and the intellect, music cannot properly exist except in performance, that is, without an intermediary, an interpreter, to bring the composer's thought to life. And since no two performers are exactly alike in emotional response, mental grasp, historical and stylistic understanding and technique—indeed, since no true artist plays any work in *precisely* the same way twice running—such a thing as an absolutely authoritative reading is an impossibility. Add to all this that music has no literal 'meaning' (beginning, as Goethe said, where words leave off) and is of quite peculiar intangibility, and it is understandable that there should still exist considerable confusion of thought, misconception and plain ignorance about how to present it in a visual medium. A radio producer once defined all material as falling into two classes: that which cried out for the microphone, and that which could be broadcast. Translating this into visual terms—that which cries out for the camera, and that which can be put on the screen—it is plain that music falls into the second category.

But if music is an abstract and invisible art, what then are we to show viewers? There are, I fancy, only three possibilities: the notation in which the music is written; images conjured up by the music or which lend themselves to being associated with it; or the performers making the music. The first—showing the text—is barely applicable to television except for purely educational purposes; the notes are too small on the screen to be read comfortably for more than a couple of bars at a time, and anyway the bulk of the audience is unlikely to be able to read music at all. I have seen a German programme devoted to the Bach Chaconne which spent most of the quarter-hour looking at a facsimile of Bach's manuscript of the work: it was a strain on the eye, and frankly rather a bore. Used as an adjunct to a programme, however, an occasional glimpse of a score, particularly if it is a reproduction of the composer's manuscript, may be interesting, as for example as an introduction to a work or movement of a work.

Associating music with extra-musical images seems, at first glance, an attractive idea, and it is one which is constantly being urged by people, mostly with somewhat limited musical perception or who are unable, or unwilling, to think in purely musical terms. This is, however, a most controversial procedure, calling for the nicest artistic judgement. The addition of dancing, scenic film or cartoon to light music immediately reduces it to an accompaniment or background; and whereas this may be of no great moment, to reduce the stature of serious music would be a very different matter. Nothing infuriates true music-lovers more than forcing their art into a position of unjustified subordination: if a serious work is artistically complete in itself, it should not have to tolerate the imposition on it of words, dance movement or any extraneous pictures. Any attempt at a pictorial interpretation of an abstract piece of music such as a symphony is misconceived, an unmusical impertinence. People who visualize pictures in their mind's eye while music is playing are very rarely capable of concentration on the musical thought itself; and to show extra-musical images on the screen is to make things even harder for them, and to run the danger of their always associating with the work images irrelevant to the composer's

conception. How many, I wonder, who saw Walt Disney's film *Fantasia* can now hear Stravinsky's *Rite of Spring* and totally banish from their minds the pictures of the earth's creation and of prehistoric monsters—images quite foreign to Stravinsky's intention?

There does exist, however, what is termed 'programme music', i.e., that which has explicit pictorial or literary associations, and here it may be permissible to draw on extra-musical images. Mussorgsky's *Pictures from an Exhibition* might be accompanied by the pictures by Hartmann which inspired them (that is, if they could all be found, which they can't), and Granados's *Goyescas* by the appropriate Goya drawings—though it would be virtually intolerable to hold a single picture on the screen for the entire duration of the piece. But with works whose programmes are vaguer, like Tchaikovsky's *Romeo and Juliet* or Liszt's *Mazeppa*, we come back to the problem of purely subjective interpretations of a composer's ideas: it is rare to find a narrative subject as specific as Dukas's *Sorcerer's Apprentice* or Berlioz's Fantastic Symphony. And in some scores by Richard Strauss, where the music is almost photographically representational—I am thinking of parts of his *Don Quixote*, for example—the orchestra already sufficiently suggests the action without our needing to gild the lily. With quasi-pictorial music of no specific detailed programme, like Respighi's *Pines of Rome* or Borodin's *In the Steppes of Central Asia*, it would be possible to associate film of the actual scenes—always provided that the length of the musical phrases was matched by that of the picture sequences—but the probability is that the music would become a mere accompaniment. We must be wary, too, of transgressing the composer's intentions: for Mendelssohn, for example, deprecated any attempt at pictorializing his *Fingal's Cave* Overture, Beethoven in a famous phrase insisted that his Pastoral Symphony was 'the expression of emotions rather than illustration', and Debussy, though his *La Mer* might seem a series of realistic impressions, made it clear that he was thinking in terms of stylization.

We are left, then, with the possibility of showing the musical performers themselves. And here a wail immediately arises from a large number of people: 'We don't want to see the players, just to listen to the music'; 'Music is to listen to, not to look at'; 'I always shut my eyes at a concert anyway'; 'I don't want to see the horn emptying out his instrument'. Ignoring this last frivolous complaint (which is perpetually being put forward as a master-stroke of wit and originality), let us concede that for a few highly cultivated musicians and music-lovers sated with opportunities for live concert-going the ear alone may be sufficient. Indeed, an even more extreme position is taken by a select handful who declare that their enjoyment of a work is marred by the imperfections inevitable with human performance, and who therefore prefer to read the score in solitude and hear the music only in their imagination.

For the generality of music-lovers, however, given the chance of a good seat in a hall where it was possible to see and hear an eminent artist with a fine orchestra, how many would be such purists as to insist on staying at home and listening to a radio relay instead? Why is it that at any piano recital—as all

concert promoters will confirm—the left-hand side of the hall sells out before the right, if not that the audience likes to watch the player's hands? People untrained in listening also admit that they find their attention wandering after a while, but that watching considerably helps their concentration. And the keen listeners who object to seeing performers are the unconscious victims of fifty years of conditioning; for until the advent first of the gramophone and then of the radio, it was of course impossible to listen to music without a sight of the artists—so that television is, as it were, restoring a lost sense of sight. Perhaps the most significant refutation of this objection, however, is provided by the evidence of what people actually do. If it were true that the majority preferred to listen and not watch, then a concert broadcast simultaneously on sound radio and television should find music-lovers faithful to their radio sets: in hard fact, it has been shown that television listeners outnumber them five to one—and this in musically quite uncompromising programmes which rule out the possibility of a large fringe audience who just leave the set on.

Music, after all, is the product of a number of human skills—the composer's and the executants'—and few but the most naïve of romantics really feel that the art is sullied by the sight of reality. Here, incidentally, I should like to read a short extract from Stravinsky's *Chroniques de ma Vie* which is very much to the point.

> I have always had a horror [he writes] of listening to music with my eyes shut, with nothing for them to do. The sight of the gestures and movements of the various parts of the body producing the music is fundamentally necessary if it is to be grasped in all its fullness. Obviously one frequently prefers to turn away one's eyes, or even close them, when the superfluity of the players' gesticulations prevents the concentration of one's faculties of hearing. But if the players' movements are evoked solely by the exigencies of the music, why not follow with the eye such movements as those of the drummer, the violinist or the trombonist, which facilitate one's auditory perceptions? As a matter of fact, those who maintain that they only enjoy music to the full with their eyes shut do not hear better than when they have them open; it is simply that the absence of visual distractions enables them to abandon themselves to the reveries induced by the lullaby of its sounds. And that it is really what they prefer to the music itself.

With which caustic comment let us leave this point.

Are we therefore justified in attempting to present this seemingly intractable, and primarily aural, subject in a visual medium? I would maintain that we are not merely justified but that we have a responsibility to make that effort. Let us not blind ourselves to the fact that with the coming of this most potent and popular mass medium the attention of the audience has switched away from radio, and unless we who care passionately for the arts insist on their representation in television programmes, very many people are in danger of being deprived of emotional and spiritual nourishment of whose existence they may perhaps be only subconsciously aware but which nevertheless can provide an important ingredient to a full and satisfying life. Appetites grow from what they feed on; and unless viewers can be offered opportunities of sharing artistic experience,

the demand may atrophy, to the disadvantage of the public and ultimately of the arts themselves. It means that television organizations must be prepared to mount programmes which are unlikely to attract the majority audience—even if they are substantial minorities—and to have the confidence to present them sufficiently frequently for tastes to be enabled to develop. I should myself like to see considerably more music being put out on both television channels, and not restricted to such late hours of the day when even enthusiasts become mentally and physically tired. It is important too that music should be presented in its own terms, and its values not debased by undue deference to topical or journalistic slants. To thump the big drum with pretentious billings and fulsome publicity, to exploit sensation value and to parade star names in an attempt to dazzle the unthinking is a vulgarity which only harms the art. Such circus-barkers' tricks serve to cheapen music and present a distorted set of standards. Of course we all want to see and hear star artists—with a few unworthy exceptions it is their outstanding technical and interpretative gifts which have made them stars—but what matters is what they perform, and how they perform it, not merely the fact of their appearing. Nor is music only a matter of star artists. They have no monopoly of outstanding performances, and it is not always the biggest names who give the discriminating listener the deepest satisfaction. Less celebrated artists, though they may not attract the snobs and the mass audience, nevertheless have much of value to bring to our musical life ; and if we are not to see it dwindle into the cult of a few world names we must also ensure that the rising younger players and singers find a place—not merely to be condescendingly patronized or their youth exploited, but on their own merits.

All this implies on the part of the camera directors both skill and musical taste and understanding. It is a matter of argument whether a producer of a science programme need be a scientist himself; so long as he has expert advice and is capable of following an exegesis of some scientific argument it may possibly even be an advantage for him to be a layman, since he can then gauge the effect of the programme on a predominantly lay public. But a music producer or director must himself have not only musical training but aural sensibility: since his task is to provide pictures—interesting and well-composed pictures, of course—which parallel the musical thought, he needs a thorough insight into his subject. In presenting an orchestral work he should know the score almost as well as the conductor. So the camera director should be not merely a television practioner who happens to like music, to a greater or less degree, but an experienced musician with visual imagination who has learnt to handle the television medium. It is the ignorance or neglect of this principle, and the absence of suitably qualified men, which is responsible for the position which obtains at present in many of the world's television stations, music in most places being presented either rather amateurishly or not at all. Countries always credited with strong musical traditions, such as Austria and Germany, frankly express doubts of their being able to tackle the problem of orchestral concerts on television—this despite what has been done, notably by certain American university stations, the Montreal station of the Canadian Broadcasting Corporation and the B.B.C. The

B.B.C. has in fact transmitted orchestral concerts and recitals almost from the outset of its television service in 1936, and the extent to which these are welcomed may be seen in the numerous demands for more concerts and in the size of the audience which follows them. A faithful regular public for symphonic music, presented quite 'straight', of two million or so—that is to say, an audience capable of filling the Royal Festival Hall nightly for two whole years—cannot be lightly dismissed. What is of even greater significance is that many of the B.B.C.'s concerts are now being relayed via the Eurovision link, or sent in recorded form, to other countries (including those hitherto sceptical of the validity of such concerts). Even professional musicians, notoriously conservative in their outlook (as witness their initial contempt and distrust for many years of the gramophone and the radio—the two media which, it is now universally accepted, have done more than anything else for the propagation of music), are beginning to lift their heads out of the sand and accept the stimulating challenge of using the new medium.

But—and here I must be frank—many are as yet very far from appreciating the importance of giving sufficient time and thought to presenting music as effectively as possible in pictorial terms. Soloists, orchestras, opera companies—and ballet companies too, for that matter—often resent the rehearsal time necessary to do more than secure merely *some* kind of picture. Indeed, some go so far as to say they prefer to 'dash off' their usual performance as it stands, with the minimum of camera rehearsal, rather than co-operate in the preparation of a well-considered presentation. It is less trouble to them, and they get their money quicker. Such cynical and inartistic approaches arise from a failure to understand that the medium must be used constructively and thoughtfully, not simply on a catch-as-catch-can basis: it needs to be realized that a camera director must put as much care over detail and polish into his work as musicians themselves give to their performances.

We need to begin by being clear in our minds about two fundamental principles. First, the sound quality must be good, or any music programme will be robbed of its *raison d'être*. (Incidentally, the complaints of poor sound sometimes received are traceable, nine times out of ten, to the inadequate audio components which far too many manufacturers include in their sets.) Second, the image should parallel and illuminate the sound, never contradict it or appear irrelevant. To expand that a little, every shot must have a musical motivation and never be included because of mere pictorial attractiveness; the sequence of shots must follow the structural rhythm of the music; and any picture which distracts attention away from the music or interferes with the listener's concentration is an impertinence.

The producer has at his disposal usually three or four cameras, each with a selection of lenses of different angles (enabling it to take anything from a close-up to a long-shot from the same position), and a variety of camera mountings enabling them to advance or retreat, look from side to side, swivel up and down or actually move higher and lower—or indeed a combination of some of these movements. He can change the picture by cutting instantaneously, or by mixing, from one camera to another, or he can if he wishes superimpose one picture on another. He could also split the screen and show two separate shots at once, insert a shot as a vignette in the corner of another, and do a number of other things most of

which are rarely suitable for serious music programmes. At once I can hear the cry arise, 'But why change shots at all? Why not just give us a picture of the whole orchestra and leave it alone?' Well, for one thing such a picture on the small screen would be merely irritating—a sea of small meaningless, apparently all but motionless, blobs; and secondly, the producer's task is to act as a proxy eye for the alert and musically intelligent viewer, who, even when he is sitting still in a concert-hall, will be constantly moving his eyes about and changing their focus according to his aural reactions. Cameras must never be allowed to roam haphazardly over the orchestra—the besetting sin of the unmusical producer: every shot must be carefully planned in relation to the score. The producer must decide what, in any passage, is the chief point of interest—the full orchestra, a section of it, a soloist, the conductor—and ensure that a camera secures the correct target, with exactness at exactly the right moment, and that changes are made with precision—but only at points (such as ends of phrases) where changes are musically justified, and only with a frequency in accord with the musical tempo and rhythm. (There should be fewer shot-changes in slow, tranquil tempi than in fast ones, particularly agitated movements.) He should not attempt to compose a new picture for every phrase, or appear to be showing off his ability to read the score, or the result is likely to be restless and destructive of concentration on the music; but if his shots are musically justified and meaningful the changes will seem natural and all but imperceptible (save subconsciously). Watching the instrumentalists in question, like watching the lips of someone talking (as one normally does) seems to clarify what one hears. In music of clear-cut phrase-lengths, it is usually best to cut from one shot to another; but if phrases overlap the picture can follow suit and mix to the next. With solo singers and instrumentalists far fewer changes of shot are called for or permissible: the camera's function then is to offer a privileged view of the artist (remembering that too close a shot of a singer at face level is undesirable). In any case, a mix (as distinct from a cut) between two angles on the same artist is nearly always objectionable. However, I cannot enter into a complete grammar of musical production: what I should like to do is to show you some illustrations of points I have been making.

A number of filmed extracts from concert programmes were then shown.

I have deliberately been restricting myself to the consideration of 'pure music' because, being the least intrinsically visual in its appeal, it offers us a concentrate of the principles involved. But music-lovers have, thank heaven, a wide variety of tastes; and one of the most tricky problems which television organizations have to face is the heterogeneous nature of the audience. They must try to satisfy the discriminating palates of the informed without driving away the larger lay public which is prepared to respond to artistic stimuli; or, to put it the other way round, they should try to attract as large an audience as can reasonably be expected to be capable of appreciation without boring or antagonizing the musically educated. Programmes must therefore exist at different levels and of diverse kinds. In the present climate of television seen primarily as a means of entertainment, expository

or 'educational' programmes about music are not much in favour—though some of us have cast envious eyes at some of the American university television programmes devoted to such things as the critical examination, rehearsal and performance of Bartók's quartets. (The 'Monitor' programmes' more angled approaches, interesting as they often are, are something quite distinct.) In more 'middle-brow' programmes the ideal, difficult as it may be of attainment, is well summarized in Sir Gerald Beadle's aphorism 'make good music popular, and popular music good'.

The most sizeable serious music audience, however, is that for opera—which is strange considering that the Philistine press is always gleefully proclaiming it (on what authority it is hard to discover) the least popular type of television programme. One might indeed have anticipated some resistance to it, since in Britain as a whole there is no live operatic tradition owing to the complete absence outside London of opera houses and the pitifully small number of operatic companies. When other countries were building their opera houses we were preoccupied with the Industrial Revolution, and Britain in civilized times has never, unlike some countries, consisted of small states vying with each other in importance and proudly boasting their own opera as evidence of their cultural status. An art therefore which demands the acceptance of as many conventions as does opera is not likely to have an easy passage here—all the more when those conventions diverge so widely from the everyday conventions of television entertainment. Yet some idea of the vast potential of the medium—and the great responsibilities it brings—can be gained from the fact that, for example, the audience for a single B.B.C. television performance of Strauss's *Salome* exceeded the total number of people throughout the world who had seen stage presentations of the work in the whole of its fifty years of existence!

Putting opera on the screen is like translating a piece of literature into another language: it must capture, so far as possible, the spirit of the original, but must equally be idiomatic in the new medium. This means that the rigid view of opera as something seen through a proscenium opening from a fairly distant seat must give way to a new conception. Since, as we saw with orchestral concerts, a long-shot of the full stage held for any length of time on the small screen becomes virtually meaningless, the cameras should seize the opportunity of bringing the spectator into the very heart of the action and so heightening the impact of the drama. Significant detail—a movement of a hand, a facial expression, even a shot of an inanimate object such as a dagger or a fan—may be infinitely more eloquent than all the broad gestures and movements appropriate to a stage production. The spectator is no longer a passive onlooker but an active participant: when Carmen throws the rose to Don José it is almost as if she is throwing it to us; when Iago spins his lying tale of Cassio dreaming of Desdemona's embraces it is not only Othello, but we, who are caught up in fascinated revulsion. The intimacy of the medium does away with the artificial gulf created by the proscenium, and conjures up the illusion of a reality all about us.

This immediately brings one axiom and two problems in its train. The axiom is that the work must be sung in the spectator's own language—useless and frustrating to thrust him into the midst of characters whom he cannot understand.

This should be equally true in the theatre, since opera is a drama, and a play whose verbal tensions or wit, interplay of dialogue or development of character or plot are not understood is simply thrown away. (But some strange attitudes are prevalent in the operatic world, where to some people opera is just a sequence of tunes, or a vehicle for some particular singer, or a test of vocal virtuosity or interpretation.) Naturally, it is essential for the translation to be in good English and not in librettese; but standards are higher these days, and several gifted opera translators are now active.

As to the problems, the first is that enforced proximity only renders more blatant the artificiality, implausibility and static nature of the more 'stagey' works of the so-called 'grand' opera tradition. The solution is to admit freely that these are not suitable for the television medium; and it is perhaps significant that they are even losing their grip on the opera-house repertoire. The bad old traditions of muddled plots, improbable coincidences, pasteboard characters and conventional 'ham' acting are fast becoming historical curiosities. The other problem—and this is a real headache—is that of casting. It is difficult enough to find singers of the right type and weight of voice for every part, but now they must be, in addition, convincing in physique and age—and in their acting. But where does one find a heroine who looks fifteen and has a lyrical-dramatic soprano voice—not to mention a face which can be made to look Japanese without too much revealing make-up? Or a real negro dramatic tenor (since a white man with a blackened face looks like a refugee from a coon show)? Large, plain, middle-aged ladies are not acceptable, in television terms, as beautiful young girls for whom heroes do and die; nor can their passionate lovers be portrayed by what Ernest Newman, in an inspired moment, called an 'amphora tenor', an amphora being 'a two-handled, big-bellied vessel, usually of clay, with a longish or shortish neck and a mouth proportioned to the size, usually resting firmly on a foot'. A solution propounded in Germany is to pre-record the music, using the most appropriate voices, and then to have the action mimed to the recording by actors physically apt to the rôles. The difficulties of synchronizing lip-movements can be quite well overcome by intensive rehearsal, but the comportment of the actors very rarely sustains the illusion that they are really singing, and so adds yet another unrealistic convention for the viewer to stomach. The alternative must lie in the most unremitting search for suitable castings, and in singers acquiring considerably more advanced acting techniques than most of them now possess; but a certain suspension of disbelief on the part of the audience will always be needed. It should be added that, in a quest for works specially suitable to the medium, a number of television stations in various countries are commissioning new operas, and thus offering direct patronage and encouragement to creative artists and interpreters.

The language barrier is something of an obstacle to the interchange of operatic productions between countries, an otherwise highly desirable objective. How illuminating to see *The Bartered Bride* in authentic Czech folk style from Prague, or *Eugene Onegin* in a production which captures the true Russian provincial atmosphere! Relays via Eurovision from Continental opera-houses—which are, of course, *reportage* of orthodox stage presentations and not television productions—

are becoming more frequent, however, and offering audiences here the opportunity of hearing more artists and more works than might otherwise come their way. In the reverse direction too, such relays as those from Glyndebourne to half-a-dozen European countries can do much to make British cultural achievements known. Restrictions by artists' unions, however, both here and abroad, create many problems.

What of the future? Unless television is to slide into the morass of facile, superficial, unthinking Admass entertainment—and this has been seen to happen in the United States—we must make every effort to ensure that intellectual and artistic programmes find sufficient representation. So far the former—programmes of informed comment, discussion and investigation—have found readier acceptance with planners and public than the latter, which demand enlightened professional guidance. But I am hopeful that in the field of music the public's response will encourage the televising of more concerts, recitals and operas; and I look forward to the day when the repertoire can be widened, and time allowed to experiment with new forms of presentation idiomatic to this most stimulating and powerful of mediums.

DISCUSSION

THE CHAIRMAN: That was a most illuminating and provocative talk. I am sure that the audience has a lot of serious questions to ask. Can I start with a frivolous one? Why is it that solo pianists on television tend to appear rather like characters out of *A Midsummer Night's Dream*—ill-lit by moonlight?

THE LECTURER: I think the answer is simply that certain producers have certain ideas about this—with which I do not necessarily agree!

THE CHAIRMAN: Another matter which interests me very much, as one who has been trained in films, is this question of the camera tracking in. When you start on a long shot of the pianist the music is just as loud as when you come right up to the keyboard. Do you think that is legitimate, considering that you are showing these pictures to viewers of whom millions have already been trained, in the cinema, to accept the travel of sound as well as the travel of the visual image?

THE LECTURER: This is a difficult and vexed question. The effect of a track-in is to increase the intensity of what one sees, and conversely a track-out is a diminuendo, but if one were really going to increase the sound in volume as one tracked-in, or—to put it in orchestral terms—if one were going to hear more loudly those instruments one sees in close-up, one would be perpetually changing the internal balance of the orchestra, which I think would be artistically intolerable.

However, the slight contradiction in vision and sound that you mention is a thing which we have thought about very considerably, and one interesting experiment which we have made is to try and combine the best of both worlds by keeping the same sound balance over-all (which one must have if one is going to have an acceptable artistic performance), but trying to highlight the close-up by using stereophonics, with one microphone on a fixed take, the other slightly increasing those instruments which are in close-up. This, without making a constant inartistic change of perspective, does give that extra little something. But the odd thing is that when one sees an instrument in close-up on the screen one imagines one hears it more clearly. In ordinary conversation one watches the lips of the person one is talking to, and it seems to clarify what he says. This is exactly what happens in the concert hall.

MR. DUDLEY GLASS: We have heard that composers on the Continent have been commissioned to write special operas for television. What has been done in commissioning composers to write programme music? Mr. Salter said that *Fantasia* was wrong in the way that it interprets Stravinsky. What if a great composer wrote an orchestral work and thought of it visually—has that been experimented on in any way?

THE LECTURER: May I correct a misunderstanding? I did not say that *only* stations on the Continent had commissioned new operas. In fact, I should say that the record in this country is probably better than in most other countries.

Commissioning of programme music has never, to my knowledge, been done anywhere. The danger is that if one has a work which is, as it were, fit for illustration, the tendency is for this to become merely a drama or a series of pictures with an accompaniment. It is very difficult, unless one has a piece of music which is already known in its own right, to prevent it being submerged.

MR. GLASS: I think composers would appreciate being given a chance to do it. They would know that the music was only for television, but nevertheless it is a great medium and their work might be repeated in a dozen different countries.

THE LECTURER: I think it might be a very interesting experiment.

MR. J. A. TOOMBS: In the speaker's illustration of the duet, I felt that the duality of the composition was rather worrying. One's eyes tended to keep switching from the pianist to the violinist until, tiring of this, they concentrated on a point mid-way between the two. If the shot had been taken from over the violinist's shoulder to include the pianist, a better composition would have resulted.

THE LECTURER: I think that the extract shown suffered from being taken out of context. In the whole of the sonata which this was taken from there were a large number of different shots, and one such as you describe did in fact come into it. The problem here is that in the violin-and-piano sonata the temptation to show either the violinist or the pianist separately for any length of time must be resisted, for it is after all a violin and piano duet on equal terms. The unmusical producer would give you the shot of the violinist pretty well the whole way through, but the correct solution—if there is one correct solution—is surely to come to whichever instrument has what Schönberg would call the *Hauptstimme* at that particular moment. When they are both playing together on equal terms one must see the two. This is a basic axiom, that the picture must accord with the musical thought.

MISS JOAN KEMP-WELCH (Associated Rediffusion): I agree with the gentleman who asked this question. If you want the public to look at two things on a screen with equal emphasis, it is important that the composition allows you to do that. The composition of the picture that you showed us made that virtually impossible because you were forced to look at either the pianist's hands or those of the violinist. The director should have balanced the picture so that you were able to see both players at a single glance and with equal emphasis.

THE LECTURER: What you are in fact saying is that these two instruments were too far apart.

MISS KEMP-WELCH: Yes, that it was a badly composed picture.

THE LECTURER: I quite agree. May I say, not in extenuation, that these extracts were chosen to demonstrate to producers both right and wrong ways.

THE CHAIRMAN: In films, if you have a dialogue sequence between two people, it is disastrous to cut as each one speaks. You find that inevitably there is always one voice, and another voice speaking off, so that you never get that pattern of backwards and forwards which is what you actually see in the concert hall.

THE LECTURER: Dialogue is slightly different because very often you will take a reaction shot, not to watch the person who is speaking, but the person to whom he is speaking. You cannot do this musically.

MR. P. H. FRIESE-GREENE: May I refer to the question of opera and the sensibility of the producer and the director transferred to those who carry out their ideas in practical ways. The camera-man needs to share in the emotional content which has to be built up. Is it not true that many of our camera-men should have some training in musical appreciation? A course at the Royal College of Music perhaps?

THE LECTURER: I sympathize with Mr. Friese-Greene's plea. I think it is highly desirable that camera-men should have some understanding of music if they are doing musical programmes. We know from experience that the best camera-men usually do have a taste for music, but whether any existing course at any existing academy or conservatory would be suitable is quite another matter.

MR. H. K. LEWENHAK: Irrespective of whether your producer is originally a musician who learnt television, or a television director who has learnt music, he would be well advised to watch a number of excellent musical films that have been made, because after all the basic visual grammar that he has at his disposal consists mainly of conventions, but they are widely and popularly accepted. There is a standard of polish in composition, in cutting on the beat, in cutting to the appropriate section of the orchestra when players are blowing down their trumpets and not when they are emptying the saliva out of them, or wiping their mouths with the back of their hands, as so often unfortunately happens.

THE LECTURER: It does not, I think, happen often.

MR. LEWENHAK: Well, to take one of the examples you showed us of the brass section in the form of three trumpeters in the background of the three horns section: in the one take they were entirely idle; the second time when we cut to them the centre player was entirely idle and one man was, in fact, wiping his mouth with the back of his hand.

Now it may be said that this was parallel to the music's intention—I don't know. Maybe it was, but it would not be my interpretation. Again, in another example, all the time the solo pianist was playing in the concerto there was an out-of-focus background of some 'cellos. If it had been a concert performance that might have been unavoidable. As this was a studio performance, there was no particular reason why the concert pianist should not have had her own background.

THE LECTURER: I am sorry to have to disagree with you. However, if you will tell me the names of these excellent musical films, we should be delighted to know of them. I know of very few musical films of orchestras in which the cutting is anything as like as good as these things are.

You say that the principles of cutting on musical phrases are widely understood; how I wish that were true! I am afraid it is not. As to the reasons why, in the case of a piano concerto, we should have the 'cellos behind her in a studio and not merely have the pianist by herself, the answer is simply that at that particular moment the 'cellos were doing something of interest, though of subsidiary interest to the pianist, and therefore it would have been wrong to isolate her and show her by herself.

MR. FRED LEWIS: As a personal reaction, I was excited in the Brahms film to see the man's face, because it revealed so much intensity in performance; it was very distracting when you cut to the drums. It was the same in the Strauss piece, where you cut to the oboe, an ingredient of the orchestra which is part of the orchestral score, as opposed to a genuine solo with accompaniment like an aria. I thought that it was a mistake to cut to an ingredient of an orchestrally composed section; the

drumming in the Brahms is not a real solo, and the oboe in *Don Juan* is not a real oboe solo. I make that as only a personal criticism. Do you agree?

THE LECTURER: I think that the justification would be that if an alert musical listener were in the hall he would instinctively let his eye rise at a big drum entry, or automatically travel along to the oboe if that player had an extended solo, and your camera is your proxy eye.

MR. LEWIS: Yes, but it was not an extended or important solo; it was all part of a cooking of the orchestral cake.

THE LECTURER: I think that this is a very arguable point. It serves to throw up, I think, the highly subjective nature of reactions to music.

MR. LEWIS: Did you like it personally?

THE LECTURER: I am not defending everything you saw on the screen by a long way, but I think the principles are right.

MR. J. B. RICHARDSON (Organizer, Chiswick Music Centre): I felt myself looking at the Strauss piece in particular with some doubts about the bare studio background. Nothing seems to go less well with the opulent music of Strauss than the background of a crypt.

THE LECTURER: I would agree.

MR. RICHARDSON: I do not know what consideration is given in orchestral productions to the back-cloth as opposed to background? In the sonata, for instance, there were merely hanging curtains, which were most effective.

My other point touches on this question of what the eye follows. How much experiment has there been, not in highlighting the obvious, but in highlighting the counter-subjects, the other textures, the things which the more experienced listener would pick out for himself in a concert hall? Is this not perhaps one of the functions of television—to highlight the things one would not otherwise listen to?

THE LECTURER: Yes, if you have a very interesting counterpoint, or some kind of slightly less important phrase or line, there are occasions when it is quite right to show it. One does not always listen just to the top, or the main melodic, line; there are obviously fascinating details which one can highlight. But if one follows those too much one falls immediately into the trap which Mr. Lewis deplores, of looking closely at details which are not of vital interest.

Your other point about decor in the studio I agree with absolutely. I think the simpler the decor the better. If one were filming, of course, one would have everything nicely composed, but with all the accidents which can happen on the television studio floor, there are occasions when even the very best of directors occasionally finds a shot which is not at all what he bargained for.

MISS JENNIFER TOOMBS: I was interested to see that in some of the examples the lighting has much to do with it. In the violin concerto, for instance, one shot showed the soloist against the whole orchestra, and he was almost lost. Could not the lighting in general be improved upon, so that the soloist is highlighted during the solo parts, in order that these are properly emphasized?

THE LECTURER: This is done sometimes. One can highlight a particular soloist or particular section of vital importance, but it is dangerous, because you are starting to highlight single elements in what should be an integrated ensemble. Incidentally, one reason why the Oistrakh could not be lit in the way you suggest was because this was taken with O.B. cameras, and not in a television studio at all.

MISS TOOMBS: I was thinking also in terms of the Franck sonata.

THE LECTURER: Well, certainly it is a lot simpler to light two people than it is to light the whole phalanx of an orchestra.

THE CHAIRMAN: Isn't there a danger that you are going to lose the atmosphere of the concert if you spotlight everything?

THE LECTURER: As soon as one starts putting one lot of people in highlight and the others in a kind of semi-penumbra, the programme turns into a kind of light entertainment show before you know where you are.

MR. C. J. BLYTON: Getting down to fundamental terms, we are human beings with five senses. I think we would agree that our visual sense is a primary sense, and our sense of hearing (and therefore music) a secondary one. We are dealing with a visual medium. We must therefore understand that no amount of evangelism will alter a natural state of affairs. At best we can only look at the mechanical function of music, which is rather like looking in the works of a clock, and enthusing over them, overlooking the fact that clocks also keep time. I feel that it might be better, so far as Commercial Television is concerned, not to relinquish our responsibilities, but to put the emphasis of serious music into more appropriate media, i.e., sound radio, rather than in what I would feel to be not quite the right medium.

THE LECTURER: I don't share this opinion. People are turning away from sound radio, and one has the responsibility of reaching the audience through the media which they patronize.

MISS KEMP-WELCH: I should like to know what Mr. Salter thinks about purely abstract designs appearing while you're listening to music? There were some very lovely designs by John Piper which were used in *The Turn of the Screw*, and I found it very satisfying just watching the camera wander amongst these vague shapes whilst I was listening to the music.

THE LECTURER: While not wishing to criticize that production at all, I personally did not like the use of those Piper backgrounds. They struck me as being almost irrelevant; but where I would say that abstracts can be useful is in cases similar to the old Fischinger films. That was a case of moving abstracts to the music, but the essence was that they were cut to the musical phrase; and this is the point I am so keen on, that if the pictures are cut *exactly* to the rhythmic structure of a phrase of the music they have validity. If you are merely going to wander round at random I don't think this adds anything at all to the music.

MISS KEMP-WELCH: I have always thought that the actual patterns of the instruments might be used more. If you saw the instruments not being played, but in patterns and shapes, it might be exciting.

THE LECTURER: This is a question of timing and of adjustment. I think in the case that you mentioned, the Piper abstracts, it did not really come off.

THE CHAIRMAN: I think the answer which Mr. Salter gave to Miss Kemp-Welch a moment ago was a summing up of everything that he has been trying to tell us. We could go on with this discussion for a long period because there is so much to talk about and so much to ask, but I am afraid that time has defeated us and I must bring this discussion very reluctantly to a close. Before I do so I am sure you wish me to thank Mr. Salter whole-heartedly for a most interesting and entertaining evening.

The vote of thanks to the Lecturer was carried with acclamation and, another having been accorded to the Chairman upon the proposal of Mrs. Mary Adams, the meeting then ended.

ECONOMIC DEVELOPMENTS IN CANADA

The Neil Matheson McWharrie Lecture by

HIS EXCELLENCY THE HONBLE. GEORGE A. DREW, Q.C.,

High Commissioner for Canada in the United Kingdom, delivered to the Commonwealth Section of the Society on Thursday, 18th May, 1961, with The Rt. Honble. Lord Tweedsmuir, O.B.E., LL.D., in the Chair

THE CHAIRMAN: The Neil Matheson McWharrie Lecture is the only one of the Society's lectures which is exclusively concerned with Canadian subjects. We are fortunate indeed in having Mr. George Drew, the Canadian High Commissioner, with us to-day, for there can be no more suitable man to talk about economic developments in Canada.

Mr. Drew was one of these distinguished men who found that the path of law led him into the path of politics. I do not think he could easily have escaped that destiny, because not only is he a Q.C. himself but he is the son of a K.C. and grandson of a Q.C., who was in the original Confederation government, whose centenary we shall celebrate in about six years time. Mr. Drew was Master of the Supreme Court of Ontario. He was for three years Chairman of the Ontario Securities Commission, and for five years Premier of the Province of Ontario. For eight years he led the Conservative opposition in Parliament, and since 1957 he has been High Commissioner.

The following lecture was then delivered.

THE LECTURE

The subject of economics has been described as the dismal science. That might reasonably suggest a very dull prospect for those who will hear my remarks about the Canadian economy to-day. The word 'economy' has been defined as 'the administration of the resources of a community'. It is in that sense that I shall use the word. I shall attempt to give you an impression of the human and material resources of Canada and of their reasonable expectations now and in the future.

Because of the somewhat gloomy pictures which have been drawn by some uninformed visitors to our country, I think I should briefly review some of the essential facts upon which any discussion of our economy must be based. Perhaps it should first be mentioned that Canada is the second largest country in the world in land area, exceeded in size only by Russia. In the whole post-war period it has been growing at a faster percentage rate of population and production than almost any other well-developed country in the world. Since the last war our population has increased by 50 per cent from 12 million to 18 million people. Our production has grown in value from $12,000 million in 1946 to $36,000 million in 1960. It is a country of widely diversified scenery, climate and surface characteristics. Along

with Russia it has the longest coastline in the world, being bounded on the east by the Atlantic, on the north by the Arctic Ocean, and on the west by the Pacific. The temperature in southern British Columbia is comparable with that of England, and from this the climate ranges to the extreme cold of the Arctic. Across the 4,000 miles of southern Canada we have in general fairly cold winters and extremely hot summers. There are vast ranges of high mountains, great lakes the size of inland seas, wide areas of forest land and in many parts of the country a rocky surface which at first presents a very forbidding appearance.

Such is the Canada the visitor sees at first glance. But in this large and dynamic country, there are other factors much more important in relation to the subject I am discussing with you. We have the greatest concentration of natural resources of any country in the free world, again exceeded only by Russia. Nor does this only offer the hope of large exports of raw materials. Already the pendulum has swung from one side to the other, and instead of a predominantly agricultural population only a comparatively few years ago, 70 per cent of our people are now engaged in industrial or related activities. This is a natural and rapidly accelerating development. Along with all our iron, copper, lead, nickel, aluminium, asbestos and other industrial minerals, we have every source of energy required for the wheels of industry—coal, hydro-electric power, oil, natural gas, and uranium. Furthermore, we have soil capable of feeding ultimately at least 200 million people.

In view of some of the gloomy reports you have read, may I simply read the words of the Canadian Minister of Finance, spoken in the House of Commons a short time ago:

> In the course of 1960, new records have been set in the fields of production and consumption, trade and employment. . . . The fact is that the Canadian economy, after a long period of vigorous expansion, is continuing to operate at a very high level. Employment has continued to increase. . . . These gains in employment are considerably higher than those achieved in the United States. In fact, from 1957 to 1960, employment in Canada increased almost twice as fast as employment in the United States.

Naturally the thought will come to the minds of many who hear this optimistic estimate of our position that we have considerable unemployment in Canada. That is true. Again may I quote the words of the Minister of Finance:

> We find ourselves in a situation which, in economic terms, is unusual, I might almost say paradoxical. As I have just mentioned, we have set new economic records this year. At the same time we have been experiencing an exceptionally rapid increase in our labour force and the level of activity has proved insufficient to keep our workers and capital facilities fully occupied.

The Minister then went on to point out that during the war there was an unusually high birth rate in Canada, and that those young people are now suddenly coming into the working force of the country. Added to that, of course, is the effect of a very rapid swing to automation and mechanization in every type of industrial activity. There can be no doubt that this does cause serious problems of adjustment when it happens. That has been the experience everywhere. But the experience elsewhere has also been that the increased production made available in this way

does absorb the workers whose occupation has been affected and that, in the end, it is beneficial from the point of view of national production and the wage level made possible by the higher *per capita* output.

I am in no way glossing over the very real difficulties presented by the present period of adjustment, nor seeking to minimize the unhappy consequences of a measure of unemployment which naturally causes great concern to every Canadian. However, I have given reasons why I believe that this is only a temporary situation, resulting not only from the rapid adoption of automation and mechanization, but also from the very speed of our growth in recent years. In the meantime, I should point out that Canada does extend financial assistance to those who are unemployed at a level exceeded by only one country in the world, and that is definitely not Russia. At this point I perhaps should mention some of the depressing stories which have appeared in one or two newspapers purporting to describe working conditions in Canada to-day. The unfortunate truth is that in Britain, as in Canada, there are those unhappy individuals who would never succeed wherever they went. It is only human nature that they should blame others than themselves. But just so that you may know how preposterous some of these stories are, and undoubtedly they have had a cumulative effect on the thoughts of some people about Canada, may I refer to a series of articles which appeared in a weekly newspaper a few months ago, which created the impression that the man whose name appeared as the author of these articles had in fact faced something close to starvation for himself and his family in Canada. As these were supported by photographs suitably misinterpreting the Canadian scene, I did receive a number of inquiries about the statements which were made. For that reason, I thought I should find out what the facts were.

This man went to Canada with his wife and one child in April of 1957. A second child was born while they were there. He worked at least 40 of the 44 months he was in Canada. During that time he received an average of well over £100 a month. I only mention this to indicate how far from reality some of these stories are. I am sure there are many people here and elsewhere who will hardly agree that £100 a month can properly be described as a starvation wage.

Although undoubtedly stories of this kind do have their effect, as I have discovered in my recent trips to different parts of Britain, they fortunately do not affect the thinking of those who study the Canadian economy as it really is, and accurately estimate its very great possibilities for the future. Only yesterday, for instance, it was announced that a well-known British investor has bought control of one of our well-known, but by no means larger, department stores for about $3 million. As this is the area of business most directly related to the prosperity of the people in general, it offers convincing proof of what well-informed people in this country do think about Canada's present and future economy. I can only repeat that in 1960 Canada produced more, consumed more, exported more and employed more people than ever before in its history.

One thing which will undoubtedly affect our economy is the share we can obtain of the rapidly expanding trade throughout the world. For that reason, we are particularly interested in our trade with Britain, not only because of our ties

of tradition and sentiment, but also because this is our largest overseas market. It is because of this interest that one trade mission after another has come from Canada during the past few years to explore the trading possibilities in every field. As a result, there has been a rapid increase in our exports during the past few years, and the extent to which this is growing is measured by the fact that for the first two months of this year, which is the latest information available, our exports to Britain have increased by 22 per cent over last year. If this trend continues, and there seems little doubt that it will, then our total exports for 1961 will reach an all-time high.

The increase of British exports to Canada in recent years has also been substantial. But not as great as the increase in our exports, and not as great as we should like to see it, or as it most certainly could be.

The thing which I should like to impress more than anything else here in Britain is the size of the potential Canadian market for British goods. Canada is already a great trading nation. Although our population is much smaller, we are the fourth trading nation in the world, exceeded only by the United States, Britain and West Germany. The value of our imports alone is substantially more than half the value of Britain's exports to the whole world. Moreover, there is one place where there is a very obvious opportunity to expand sales to Canada. Last year we imported merchandise to the value of $3,718 million from the United States. That gave us an adverse visible trade balance with them of $679 million. It would be to our advantage, to your advantage, and ultimately to the advantage of the United States as well, if British producers would examine the things we are buying from the United States and by hard, vigorous and sustained selling methods and effective servicing organizations, add that amount to their exports to Canada, or in other words more than double their present exports to our country.

It can be done. It cannot be done, however, by governments; in a free economy they can only create the favourable climate for trade. It must be done by the direct and imaginative selling methods which produce new trade everywhere. It must be done by individuals or the representatives of companies seeking business on the spot.

Overseas markets are, of course, an extension of the home market. We must always remember, however, that in the case of industrial products, those which are to be exported must be adapted to and suitable for the outside markets where they are to be sold. That applies as much to our export business as to yours. There are many things that we can do to expand our export business, but I also would be less than frank if I failed to say that many manufacturers in this country have not yet made any real effort to explore the possibilities of expanding their sales to Canada.

Nor is it the present market alone which should be in the minds of those who think of the Canadian economy and the future of our country. If we continue to grow as we have during the past 20 years, we will have a population of at least 35 million people at the end of another 20 years, and in 40 years, a population of somewhere between 60 and 70 million people, or perhaps much more. That is a fair estimate of the economy of Canada in human population and in earning

power. Within the life-time of many people starting in business in this country to-day, Canada will have a larger population than Britain. That is the market to which we ask the producers of this country to look.

In talking of our economy, I perhaps should say something about the possible consequences of regional economic grouping, which might affect our own export business. However, I am sure that Canadians will be greatly re-assured by the statement made by Mr. Macmillan in the House of Commons the day before yesterday (16th May) that, 'I hope we shall be able to form a partnership in Europe while fully carrying out our duties to the Commonwealth, agriculture and also to our partners in EFTA'. They will be equally re-assured by the statement made yesterday by the Lord Privy Seal, also in the House of Commons: 'We have always made it plain—and I repeat it now—that we shall keep in close touch throughout with other Commonwealth governments, and will have full consultation with them before we decide on the course to follow'.

It seems to me unlikely that, in this period of rapidly expanding world trade, whatever rationalization of economic relations there may be throughout Europe, those whose industrial production is so important to others as well as themselves would take any step which would isolate them from the rest of the world. That I cannot believe.

I do believe in the immense possibilities of expanded trade between Britain, Canada, the other members of the Commonwealth and the whole free world. Our own economy justifies our confidence in the part we will be called upon to play in that expanding development. But, above all, I should like to think that across these short sea routes in the North Atlantic there will be rapidly expanding trade between our two countries which, in peace and war, have stood side by side for so long, and which have so much to offer each other in the future.

DISCUSSION

MR. B. CHARLES-DEAN (Managing Director, Dollar Trade Promotions Ltd.): Could Mr. Drew give some indication of the repercussions of the trade mission which visited this country two or three years ago. I had three very interesting business discussions with members of the mission, but it never seemed that any report came out to indicate whether, from the psychological point of view, it had helped to bring about definite results.

THE LECTURER: I assume that you are referring to the trade mission which came over here in November of 1957 with the rather unusual purpose of showing how more goods could be sold from this country to Canada, although the people who came were all people engaged themselves in selling things abroad. That mission did produce positive results; there has since been a very substantial increase in exports from this country to Canada.

But I do not think that anything like enough British business men are availing themselves of the opportunities that do exist; it would be to the mutual advantage of both countries if the effort made at that time was carried forward and more people tried to sell in Canada. The market is there, to our advantage, to your advantage and ultimately to the advantage of the United States as well. Some six or seven hundred million dollars worth of additional sales could be made to Canada. It would not only help to balance, but make it possible for us to greatly extend, our exports

here. It would balance our trade with the United States and at the same time remove some of the undoubted sources of friction between Canada and the United States which exist today.

SIR SELWYN SELWYN-CLARKE, K.B.E., C.M.G., M.C.: Would it be fair to ask His Excellency his views in relation to the proposal that Great Britain should join the Common Market? Is that likely to be in the mutual interests of trade relations between Canada and the United Kingdom?

THE LECTURER: There is nothing unfair about the question. My own impression is that no one knows yet of any proposals which have been made. In the House of Commons yesterday Mr. Heath closed his remarks with regard to this subject by saying that no clear plan had yet emerged, and it was in relation to this that I quoted what he said about assurances that there would be prior consultation with the countries of the Commonwealth before this took place.

Since you have raised this question, there is one point that I think might well be cleared a little further, and that is (if I rightly interpret the statements that have been made in the House) that the British Government is not thinking of a limited association with the Six, but rather of a wider association with the countries of Europe, with a consequent reduction of some of these artificial barriers that exist between them at the moment. Take as an example the situation in the U.S.S.R., where there is coal and power on both sides of the boundary and where it is rational to have them working in some way together. A similar situation exists in many places in Europe. That sort of thing can be done to the advantage of everybody. Whether it would be good or bad would depend entirely upon whether the ultimate association acted in a restricted manner or simply acted for its mutual advantage, to strengthen its production and therefore become a larger purchasing market. I should hope that it would be the latter.

MR. WILLIAM G. MUNRO, B.COM., F.L.M.I. (Imperial Life Assurance Company of Canada): My impression is that the majority of people in Great Britain don't really understand why Canada is being so vocal about the Common Market in relation to, say, Australia and New Zealand. I should like to hear Mr. Drew's comments as to why Canada is making such a stir, when she ranks among the least affected of the whole group.

THE LECTURER: Is Canada perculiarly vocal on this? I was under the impression that New Zealand had been vocal, too, about what would happen to their agricultural products, and I thought Australia was equally vocal. There has been concern rather than criticism on the part of Canada, because we do not know, as of to-day, what the plans *are*. It is not possible to say whether it would injure us or otherwise until we know what might emerge.

Canada would be concerned if this great European industrial area, which embraces a population larger than the United States, became severely restricted, and the whole trend to wider trading methods and freer trade relations were reversed. We are assured, however, that nothing will happen until after the Commonwealth have had an opportunity of discussing any tentative proposals that are made.

PROFESSOR T. H. SILCOCK (Institute of Commonwealth Studies): I should like to raise quite a different question about this Common Market issue. I wonder whether in the long run the political implications of closer association between Britain and the Common Market are as much in the background of thinking in Canada as they are in this country? Thinking—that is to say—that joining the Common Market would very probably mean a change in the whole nature of the Commonwealth relationship. Does Canada view this with alarm, or is its concern really only economic?

THE LECTURER: I should think that the general opinion in Canada is that there is

not the slightest chance of this country, with its great traditions of parliamentary government, submitting itself to some supra-national organization.

MR. J. D. BAILEY (Sun Life Assurance Company of Canada): As I understand it, Sir, you suggested that one of the reasons for your hope that Britain and Canada would remain closely tied was the potential in the Canadian market, and the hope that it would remain complementary to Britain's. It could equally be argued that the Canadian market is more complementary to the American market and that Britain would more naturally trade with European countries. This leads one to think that one of the main reasons behind Canada's approach to Britain on the Common Market question is the fear that if Canada is left out it will mean that it must become tied to America even more closely than at present.

THE LECTURER: I would start by saying that I don't think there is any chance whatever of Canada at any time becoming part of the United States. We are friendly with them, but, perhaps wrongly, we think we have a better system and we have carried forward the parliamentary processes of this country. In fact it is often said that our governmental system is a precise transcript of Westminster.

I cannot agree that our trade is more complementary with the United States than it is with this country, or that this country's more natural trading relationship is with Europe. After all, what this country needs above everything else for its industrial production is raw materials, and I don't know where it will get raw materials in Europe. I do not know any part of Europe from which Britain is going to get coal, titanium, brass, thermine, copper, zinc, lead or iron (they are not going to get iron from Ruhr or the U.S.S.R.). It is not going to get any single resource that I know of from Europe except in specialized quantities of limited articles. But Canada has every type of natural resource which is needed for the industrial production in this country. The only important mineral which we have not in Canada is bauxite, from which aluminium is made, but we have excellent opportunities for imports of this from Jamaica and South America as well as from other parts of the world, and as a result we are certainly the second largest if not the largest producer of aluminium to-day.

So that from the point of view of the industrial needs of this country we have everything, across the shortest sea route available to Britain. It is in that sense that I mean the markets are complementary. They are also complementary for another reason. Canada is becoming increasingly an industrial nation. We make our own automobiles, for example, and our own electrical equipment. We are in direct competition with the U.S.A., and as time goes on we probably will be exporting a great many things to the United States, because the Paley Report (now ten years old) which was produced by great economists in the United States predicted that in twenty-five years time the United States would be a have-not nation in respect of a great many of the essential raw materials. That is only fifteen years from now. When that time comes it won't merely be a case of our digging these things out of the soil and selling to the United States; we shall be making the things and sending them there.

But in the meantime there is this great opportunity for sending raw materials over to Britain. We have iron beyond the dreams of immediate needs. We exported just over two million dollars worth of iron ore ten years ago. Last year we exported 200 million dollars worth of iron ore. We exported one hundred thousand tons of steel to Britain last year. That was the first time it has ever been done, and increasing amounts are coming. So I still believe that our economies are complementary, that we can supply the basic requirements and the raw materials. Conversely, people in this country are now supplying a very large part of Canada's heavy generating and distributing electrical equipment, and many types of our machine tools. We spent a total of 3,600 million dollars last year buying things from the United States;

if producers in this country will examine the list they will find it includes a number of things that they can sell to Canada.

MR. ALBERT WILLIAMS: As climate has a very important influence on production, could we have a little more information on the climate of Canada in comparison with this country? For instance, how much of Canada has a temperature the same as is general in this country.?

THE LECTURER: The climate of Southern Canada is a very pleasant one which in no way limits our opportunities to carry on business. We have cold weather, but throughout the year the factories operate full-time, the roads are kept open all the time, and so is every other means of transportation. If you ask me how much of Canada is available for industrial or agricultural production, I should say that, excluding the mineral and rocky areas of the north, we have probably twenty times the area of the British Isles available for that purpose.

MR. S. BYARS (Canadian Pacific): In answer to a previous question Mr. Drew mentioned that in the foreseeable future the United States will be a 'have-not' nation. Do the U.S. industrialists show that they recognize this by the tremendous investments they have made in Canadian natural resources? Does Mr. Drew think that Canadian governments of the future may have to take steps to control the authority over Canadian natural resources—or could we expect that when the United States does run out of her own raw materials she will by then control the Canadian raw materials to a large extent?

THE LECTURER: That is a very natural and reasonable question. I am not picturing the United States as simply a have-not nation, except in relation to many of the raw materials; I mean they will not have sufficient of their own to meet the demands of their industries.

I can give you an illustration of this. Fifty years ago the pulp and paper industry of Canada was a very small one. The major part of the cutting of our logs was for the purpose of floating them across the lakes to mills in the United States. Gradually as our activities and transport facilities increased, the American companies as well as our own—there are a number of important American companies which control newsprint industries in Canada—started to make the paper in Canada, and as a result we are to-day the largest producers of newsprint in the world. Many of the companies which have contributed to that are United States companies.

In precisely the same way, it is true that there has been an immense investment in the iron deposits of Quebec, Labrador, Ontario by American capital, but already we are seeing a very rapid expansion in the milling facilities of the steel companies of Canada. Undoubtedly the tendency will be for those companies which control the iron ore areas to reduce the produce that they must ship to its smallest size, in relation to value, for the transportation is becoming increasingly costly, and it will be far more economic for the United States to ship steel at least in block form from the great areas along the lakes, from Western Ontario or Labrador or Eastern Quebec, and have it processed there. I am not at all concerned. It is my belief that capital will be fairly treated in Canada, as capital investment should be in a free economy, but I am also perfectly certain that no Canadian government now or in the future will disregard the interests of Canada in the use of the raw materials that come from the soil.

THE CHAIRMAN: It remains for me to thank those who have made this meeting so extremely interesting. I have two people to thank. First, the founder of this lecture, Lady Pigott, who I am happy to say is with us to-day, and secondly, our speaker. I am very pleased that Mrs. Drew has been able to come with him.

Mr. Drew said that economics was sometimes called the dismal science. Well, he certainly made his candid picture anything but dismal, and I do not think anyone

will again approach the subject of Canada's economy with any obituary solemnity, after his words. When I first went there twenty-five years ago, the whole picture was absolutely unrecognizable from what it is to-day. Canada then lived largely by the products of the soil. Most people who went there found it more or less British or American than they had expected, for Canada had a much less clear cut identity than to-day. The whole of that great mass of rock covering northern and central Canada which is called the Canadian Shield was thought to be a piece of waste creation. It is now known to be the greatest treasure house that the world has ever known. Canada has developed an identity as clear-cut as that of the oldest nations in the world, and she has progressed from merely living on the products of the soil to be one of the world's greatest manufacturing powers.

We are very grateful to you, Sir, for your lecture and for the fair and frank way in which you answered the questions. We should like, if it would not be going too far, to congratulate Canada on her representative in London, and say from us all, we wish you well and hope you will stay with us.

The vote of thanks to the Lecturer was carried with acclamation.

MR. OSWALD P. MILNE (Chairman of Council of the Society): You have been told that Lady Pigott founded this Neil Matheson McWharrie Lecture. She did so in memory of her first husband, and she tells me she was inspired to this step by Lord Bennett, who was, as you know, Prime Minister of Canada and afterwards Chairman of Council and President of this Society.

Lord Tweedsmuir said that no more suitable person than the High Commissioner could be called upon to give this lecture. I am sure you will agree that no more suitable person than Lord Tweedsmuir could have taken the Chair, and we all thank him very much for presiding this afternoon.

The vote of thanks to the Chairman was carried with acclamation, and the meeting then ended.

FOTHERGILL PRIZE ESSAY*

AN AUTOMATIC DOOR STOP

By R. E. SANT, Grad. I. Fire E.

I witnessed a very serious fire in which people were trapped on the upper floors of a large departmental store, unable to escape by the staircase because of severe heat and smoke conditions. It was later reported at the inquiry that the smoke doors had been wedged open prior to the fire, to assist in the ventilation of the building.

I therefore suggest that a door stop be designed which would allow the doors to be secured in the open position, as required during normal conditions, and yet permit them to swing to the closed position during an emergency. This could be achieved by fitting the door stop with an electro-magnet, which would over-ride the door stop and allow the doors to close. The magnet would be connected to the existing fire warning system, and on the sounding of the alarm, it would render all door stops inoperative until each individual door stop was reset manually. The testing of the door stops would be carried out automatically during the normal testing of the fire alarm system.

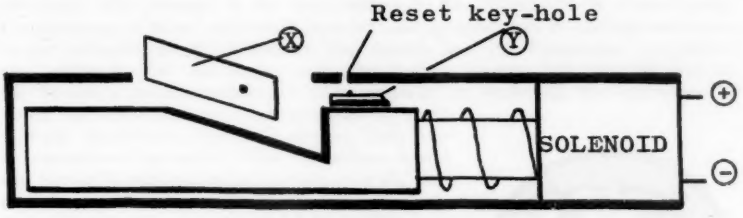

DIAGRAM A

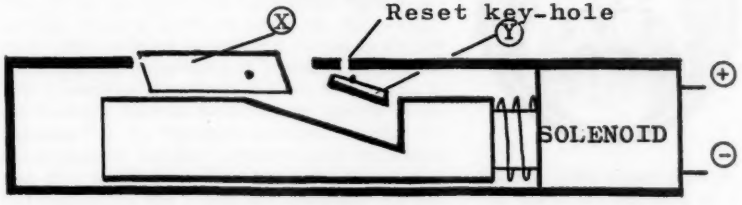

DIAGRAM B

* For this essay, Mr. Sant was awarded the 1961 Fothergill Prize of £20. For details of the results of this year's Prize Competitions, see page 910 of this issue.

The system envisaged is as follows:

In diagram A the door stop is in the normal working position, allowing the spring-loaded stop to be used as required. In diagram B, it will be seen that the solenoid has operated, causing the door stop X to lie flush with the body of the assembly. This allows the doors to swing to the closed position.

The pawl Y now falls into the seating recess, keeping the door stop inoperative until the unit is reset manually; this prevents the doors from being inadvertently locked open.

The unit is reset by means of an ordinary screw type key being screwed into the face of the assembly, tripping the pawl, and allowing the sliding bar, under the action of the spring, to return to the normal position.

By means of this very simple device almost any swing door can be automatically used as a smoke-stopping door.

[*The author is applying for the protection of a patent in respect of the idea described in this essay.*]

GENERAL NOTES

EPSTEIN MEMORIAL EXHIBITION

A memorial exhibition of works by Epstein, arranged by the Arts Council, will be on view at the Tate Gallery from 3rd November until 17th December (admission 3*s.* 6*d.*). The exhibition is not as comprehensive as that recently shown in Edinburgh and described by Mr. Nevile Wallis in the October *Journal* (p. 898): rather is it designed to bring together diverse and representative works from all periods of Epstein's creative life. For this purpose Lady Epstein and Sir John Rothenstein have chosen some 80 sculptures and 50 drawings. Among the larger works on view are *'Consummatum Est', Jacob and the Angel,* and plaster casts of the *Madonna* from Cavendish Square and of the *Christ in Majesty* from Llandaff Cathedral. The bronzes include Epstein's portraits of *Winston Churchill, Bertrand Russell* and *Dr. Fisher, Archbishop of Canterbury.*

STUDIES IN THE SOCIETY'S ARCHIVES XXI

The Society of Arts and the Committee of the Privy Council for Trade, 1786–1815 (iv)*

The interchanges between the Society of Arts and the Committee of the Privy Council for Trade which have been described in the previous sections of this article were often fruitless. Out of the sixteen topics which brought the two bodies together, only in three cases can it be said that positive results emerged from the correspondence. The changes in the laws relating to the importation of cashew gum,[1] Portuguese goat skins,[2] and black lead for melting pots[3] may be directly attributed to the consultations held between the Society and the Committee. Legislation also followed the exchanges over the biscuit bounty but did not embody the Society's recommendations.[1] The campaign to encourage the cultivation of hemp was considered by contemporaries to be of national significance, but in it neither body can be considered successful.[3] The Committee found the Society's response unsatisfactory over the discoveries of Cuthbert Gordon,[3] Bourbillon de Bonneuil,[1] Godfrey and Higgins,[1] James Glenny,[1] Le Texier,[1] and Swinton, Blease and Co.[2] The Society was ignored by the Committee when it forwarded Nicholas Brooke's letter on the woollen trade,[1] and it failed to secure a change in the law restricting the importation of Jamaican cinnamon.[2] The Committee gave little beyond its blessing to the Society's scheme for a botanic garden in the Bahamas.[2] G. O. Needham received a bounty for his inventions, but the Committee told the Society that they would have done better for him if they had approached the House of Commons.[2] By presenting a model of a corn mill to the Repository the Committee at least showed that it recognized the Society's function as an industrial museum.[2]

The Seal of the Board of Trade. The design was approved by a warrant dated 18th September, 1786, and is still in use. It is reproduced by permission of the Board.

*Parts (i), (ii) and (iii) appeared respectively in the issues of the *Journal* for April, July and September, 1961.

Nevertheless, the correspondence shows that the Committee held the Society in esteem as a body of national standing whose opinion, like that of the Royal Society,[4] should be heard on technical and scientific matters. It also testifies to the administrative vigour of the Committee during the presidency of Lord Liverpool, from 1786 to 1804, and particularly in the years before the war with Revolutionary France made fiscal and military affairs the main concern of government. The greater part of the correspondence took place before 1797, after which year, as Sir H. L. Smith puts it, the Committee's 'attention was practically monopolised by questions of essential supplies and blockade'.[5]

Lord Liverpool's association with the Society and his private correspondence with Samuel More has already been mentioned.[6] After his death a statement was printed in the Society's *Transactions* referring to 'The very great attention which his Lordship ever paid to the interests of the trade and commerce of this country', which was said to have given him 'a peculiar claim to the respect of the Society'. Mention was also made of the 'marked attention' which he had given to the Society's 'Communications on various points of commercial business'.[7] The Society's aim of fostering the 'Increase of Trade' and the 'Riches and Honour of this Kingdom'[8] had fitted in with his own 'mercantilist' attitudes and had no doubt helped to cement its association with the Committee of the Privy Council for Trade, whose chief clerk, George Chalmers, was a well-known champion of traditional economic policies.[9] It is significant that the correspondence between the Society and the Committee does not continue beyond the secretaryship of Charles Taylor, 1799 to 1816. Taylor had known both Liverpool and Chalmers before his appointment as the Society's Secretary[10] and had been involved in the investigations into Cuthbert Gordon's moss dye;[11] he represented a link with the earlier period of co-operation between the Committee and the Society which was to be broken by his death. In the subsequent decades both the Society and the Committee underwent the 'transformation' common to many institutions of the period.[12] At mid-century they again came together through their common interest in the Schools of Design.[13] In that time of Free Trade fervour the Society's association with the first Earl of Liverpool must have seemed remote indeed.

(*Concluded*)

D. G. C. A.

1. See Part (ii): July *Journal*.
2. See Part (iii): September *Journal*.
3. See Part (i): April *Journal*.
4. G. A. Cockcroft, *The public life of George Chalmers*, p. 91; W. R. Dawson (ed.), *The Banks Letters* (London, 1958), pp. 450–72.
5. Sir H. L. Smith, *The Board of Trade*, pp. 48–50.
6. See Part (i), reference 9.
7. *Transactions*, Vol. XXVII (1809), p. iii.
8. William Shipley, notice *To the Publick*, London, 15th June, 1754.
9. G. A. Cockcroft, op. cit.
10. See Part (i), reference 11.
11. BT5/4, 26th Oct., 1787; BT5/5, 9th Feb., 1788.
12. See R. Prouty, *The Transformation of the Board of Trade*, pp. 2–4.
13. Sir H. T. Wood, *The History of the Royal Society of Arts*, pp. 407–8.

The advice and assistance of Mr. K. A. Mallaber, Librarian to the Board of Trade, is gratefully acknowledged.

OBITUARY

SIR WILLIAM REID DICK

Sir William Reid Dick, K.C.V.O., R.A., the distinguished sculptor, died on

2nd October, aged 82. He was a former recipient of the Society's Albert Medal, awarded to him in 1948 'for national memories in living stone'.

He was born in Glasgow, and studied there and in London. The Royal Academy first exhibited his work in 1908, and he was elected A.R.A. in 1921 and R.A. in 1928. He became President of the Royal Society of British Sculptors in 1933, and two years later was made K.C.V.O. In 1938 he was appointed Sculptor in Ordinary to the King (George VI) in Scotland. One of Dick's most widely noticed works was the National Memorial to King George V at Westminster, and he was also responsible for the effigy on that monarch's tomb in St. George's Chapel, Windsor, for the statue of President Roosevelt in Grosvenor Square, and for a notable sculpture group in the Kitchener Memorial Chapel in St. George's Square.

Though the great majority of Dick's public commissions were for statues and portrait busts, he also executed a considerable number of purely imaginative works, particularly in his earlier years. Both sides of his artistry are represented in public collections in this country and the Commonwealth.

THE HONBLE. ONESIME GAGNON

The Honble. Onesime Gagnon, P.C., Q.C., LL.D., Lieutenant-Governor of Quebec, died in Ottawa on 30th September, aged 72. Gagnon, whose French ancestors had emigrated to Canada in the seventeenth century, was educated at Laval University, P.Q., and at Oxford, where he was a Rhodes scholar. He had established a flourishing practice at the Canadian bar before entering politics in the Conservative interest. He was elected to the Parliament at Ottawa in 1930, and soon became prominent there. For a short time before the election of 1935 he held the office of Minister without Portfolio in Lord Bennett's cabinet. Subsequently he joined Mr. Maurice Duplessis' Union Nationale Party, and having been elected to the Quebec Legislature in 1936, was appointed Minister of Mines, Game and Fisheries for the Province. In 1944, when the Union Nationale was returned to power after five years in Opposition, Gagnon became Minister of Finance, a post which he held until he retired from political life in 1958 to become Lieutenant-Governor.

Gagnon was a former President of the Société des Arts, Sciences et Lettres. He was elected a Fellow of this Society in 1950.

MR. EDWARD LUNN

Mr. Edward Lunn, who died on 19th September, aged 23, was one of the ablest young designers ever to have taken part in the Society's Industrial Art Bursaries Competition. He entered the competitions held in 1957 and 1959 and both times was awarded a bursary offered in the Footwear Section. Last year he won three awards in the national competition organized by the *Footwear Journal*. A native of Northampton, Lunn studied boot and shoe manufacture at the city's College of Technology, and design at the Northampton School of Art, before embarking on a professional career of much promise. He was elected a Fellow of this Society in 1959.

THE HONBLE. SIR DAVID BOWES LYON

The Honble. Sir David Bowes Lyon, K.C.V.O., died at Ballater, Scotland, on 13th September, aged 59. The youngest son of the 16th Earl of Strathmore, he was a brother of Her Majesty Queen Elizabeth The Queen Mother and an uncle of Her Majesty The Queen.

Sir David had extensive business interests. He was Managing Director of Lazard Bros. and Co. and Sub-Governor of the Royal Exchange Assurance, and a Director of Martin's Bank, the Cunard Steamship Co., the Dunlop Rubber Co. and The Times Publishing Co.

During the Second World War he worked for a time in the Ministry of Economic

Warfare, and was then appointed Head of the Political Warfare Mission in Washington. In this capacity he performed an outstanding service to his country's and the Allied cause, and established excellent relations with the Americans, including the President himself.

As a young man Bowes Lyon contemplated taking up horticulture as a career. His enthusiasm in this regard was lifelong, and rooted in his own splendid garden at St. Paul's Walden, Bury. He was for many years closely associated with the Royal Horticultural Society, as a Member of Council, as Treasurer, and since 1953 as President. In the latter year he was awarded the Society's Victoria Gold Medal for Horticulture. He had also been Chairman of the Gardens Committee of the National Trust since 1953, and during the last decade acted as Honorary Treasurer of the Gardeners Royal Benevolent Society.

Sir David was a Trustee of the British Museum. In his own county of Hertfordshire he had long been a Justice of the Peace, and became High Sheriff in 1950 and Lord Lieutenant in 1952. He was made K.C.V.O. in 1959. His election to Fellowship of this Society took place in 1954.

NOTES ON BOOKS.

BELOVED SON FELIX. ***The Journal of Felix Platter, a Medical Student in Montpellier in the Sixteenth Century. Translated and introduced by Seán Jennett. London, Frederick Muller, 1961. 25s net***

Felix Platter's journal of his journey from Basle to Montpellier, of his studies there, and of his return home is one of the earliest travel diaries of its kind and surely one of the most truthful. It is also one of the most interesting, its only fault being that it is too short. It has now been admirably translated into English in its entirety.

Platter's father, born of Swiss *petit bourgeoisie*, had by his ability become the head of a school and the prosperous proprietor of a printing establishment. Determined that his son Felix should have advantages that he had not enjoyed himself, he sent him in 1552 at the age of fifteen to study medicine in Montpellier, then an important medical centre, second only to Padua. In spite of his youth Felix Platter was capable of profiting fully by his opportunities. He was a lad of intelligence and courage and, having decided to keep a diary, set down his experiences consistently and without guile, whether he was attending an autopsy, witnessing an execution, or buying clothes.

The special interest of his diary is the impression of medical education at Montpellier to be gathered from it. He gives, however, no consecutive account of this, and the picture must be constructed out of hints dropped in the course of his narrative. Repeatedly he was able to witness dissections presided over by the great Rondelet, on one occasion the subject being a monkey and on another 'a handsome courtesan' who had died in childbirth. He was so determined to gain all the knowledge he could that he never missed these demonstrations and even exposed himself to danger by taking part in nocturnal body-snatching operations conducted with drawn swords in monastic cemeteries, sometimes assisted by a priest. Felix does not often specify the text books that he used, and the name of Vesalius only occurs in mentioning a room in the Basle printing works leased by his father to a relative of the great anatomist. On the other hand he remarks that he 'once more began to study the illustrated works of Galen'. The German students also held private disputations among themselves and at these Felix was one of the first to speak. When finally he came to sit for his baccalaureate he had to dispute with three doctors of the University and three licentiates, this ordeal lasting from six o'clock in the

morning until nine. Afterwards he was arrayed in a red robe and had to return thanks in verse. In this he found no difficulty, having been able to speak fluently in Latin when he first arrived in Montpellier.

In January, 1557, Felix made preparations for his return home, but he had so much enjoyed his student days that he shed tears before he left at the thought that he would never see Montpellier again. His journey back to Basle was full of incidents and interesting observations, four-and-a-half weeks being devoted to seeing the sights of Paris and its neighbourhood. At Saint-Denis he even saw the masons still at work on the tomb of François I, and numerous Christian relics such as the head of St. Denis himself encased in silver and gold with that of St. Benedict. He arrived at Basle after three months' travelling, and in front of his father's gate saw a man going to a doctor to have his urine examined. This he regarded as a good omen, and it is pleasant to know that he was justified, for he lived to become a leading practitioner in Basle. He died in 1614 after a long and useful life, and posterity may be grateful to him for so deeply interesting a document as this diary. The manuscript is now in the library of the University of Basle; it was published in the nineteenth century both in German and in French, but the edition now reviewed is the first appearance in English and the text offered is fully worthy of so interesting a subject.

GEOFFREY KEYNES

A MODERN RUSSIAN READER FOR TECHNICAL COLLEGE STUDENTS. *Edited by N. S. Fudel'. Prepared from the Russian by D. G. Fry. London, Pergamon Press.* 1961. 35*s net.*

This book is adapted from a similar work used by foreign students during their first year of a full-time course at a Soviet university or technical college, and is suggested for use here by students in the second or third year of a Russian language course. It is not intended, then, for beginners, who might do better to start with Fourman's *Science Russian Course*, which contains what it describes as 'the necessary minimum of grammar' compressed into 46 pages, followed by 170 of reading exercises in six branches of science; or the Turkeviches' *Russian for the Scientist*, which is a comprehensive grammar and reader, with exercises based on four branches of science annexed to each lesson.

This book is what it says, a reader. The first part is divided into pieces for translation from Russian grouped under four headings: Work, Life and Leisure; Round and About in Russia (e.g., The Discovery of Vorkutá, The Subjugation of Virgin Lands); Nature and Technology (e.g., The Tunguska meteorite, the atomic icebreaker *Lenin*); Russian Scholars, Research Workers and Inventors (from Lomonosov to Tsiolkovskii, who died in 1935).

Part two consists of notes of particularly valuable words in the reading exercises and simple practice in writing Russian.

The exercises are a good mixture of simplicity of form with subjects of technological interest. The student will come to the book equipped, presumably, with enough Russian accidence to enable him to recognize the parts of speech, and enough grammar to grasp their relation to each other, and Russian syntax is of the simplest; so that he will be able to build up a technical vocabulary quickly and easily. The story of the discovery of the coal-field at Vorkutá, for instance, is simply told and for the most part in the words of the Komi Viktor Popóv, who was wild-fowling with his son when he noticed a lump of coal lying on the river-bank. He sent a piece to Lenin in 1921, and this gave the impulse to the rapid development of the area. If the reader is equipped as I have assumed above he will have no difficulty in translating such a piece as this with the aid of a dictionary (for there is no vocabulary); and if he has anything of a turn for languages he will remember those words which will be serviceable to him.

The book is reproduced by photo-lithography. It is perfectly clear and legible. The stress-accent, so important and so unaccountable, is marked all the way through.

HUMPHREY HIGGENS

GREAT CENTRAL: VOL. I—THE PROGENITORS, 1813–1863. *By George Dow. London, Locomotive Publishing Co.*, 1960. 35*s net*

There have been various massive histories of the railways of the past, but the 300 pages of this volume, the first of three, foreshadow a record more comprehensive than any of its predecessors. The author has not merely a subject after his own heart, however, for few railways could better repay the painstaking research that has gone into the making of this book than the one-time Manchester, Sheffield & Lincolnshire, destined at the turn of the century to be the last main line to make its way into London and to become the Great Central.

It is a history which centres largely on the activities of one of the most famous of Britain's 'railway kings', Edward Watkin, whose appointment as General Manager of the M.S. & L., in 1854, comes within the period covered by this volume. How he gradually built up his 'kingdom' by becoming in succession Chairman of the Metropolitan and South Eastern Railways, not to mention having a considerable interest in the promotion of the Channel Tunnel, and finally, against the intense opposition of competing railways, how he succeeded in linking the M.S. & L. and the Metropolitan together by the extension to London opened in 1899, will be described in the later volumes; but these happenings are the measure of this outstanding man.

Volume I deals with the driving of the Sheffield, Ashton-under-Lyne & Manchester Railway through the backbone of England, including the great viaducts at Dinting and Mottram, and above all the 3-mile tunnel through the millstone grit of the Pennines between Dunford and Woodhead—the most notable engineering work of its kind that had been completed in Great Britain up to that date. The welfare of navvies was of little account in those days, and the author gives a lengthy account of the terrible conditions in which they were herded together on the bleak moorland at Woodhead—conditions which eventually attracted the pointed attention of social workers in both Manchester and Sheffield. After the opening throughout of the Sheffield, Ashton-under-Lyne & Manchester in 1845 there came the amalgamation with the Great Grimsby & Sheffield Junction and the Sheffield & Lincolnshire Junction, so forming a railway stretching across the width of the country which assumed the title of Manchester, Sheffield & Lincolnshire.

What happened thereafter under the aegis of Watkin makes fascinating reading. For three decades the M.S. & L. was in the focus of every kind of warfare and intrigue. In turn it was wooed by the London & North Western, Midland and Great Northern Railways, and was either forming alliances with one or other of them to fight the remaining two, or perhaps was attempting single-handed to fight all three. It seems almost unbelievable that the alliance with the Great Northern which in 1858 for the first time brought G.N.R. trains in five hours from London into the L.N.W.R. London Road Station in Manchester should have been so furiously opposed by the latter company that in addition to every kind of obstruction L.N.W.R. minions tried to arrest G.N.R. passengers as they left the station in Manchester. Also, so cut-throat was the competition, that return fares of third class passengers between London and Manchester came down to five shillings a head. Such are some of the happenings dealt with in detail in this admirable and well-produced book.

CECIL J. ALLEN

TROPICAL HOUSES. *By David Oakley. London, Batsford, 1961. 42s net*

In 1947 there appeared one of the first books published in this country on building in the tropics. It was *Village Housing in the Tropics* and was written by Maxwell Fry and his wife and partner Jane Drew. It was primarily a guide on general principles to assist West African administrators, who were often without professional help. In 1956 Batsford published *Tropical Architecture in the Humid Zone*. Written by the same authors, this was a more technical work dealing with peoples, their needs, climate, materials and methods of building. It covered the broad principles of design over a range of building types.

In *Tropical Houses* Mr. Oakley has confined himself to a narrower field, but he covers the hot dry as well as the hot humid regions. If his illustrations are fewer and perhaps less exciting than those in *Tropical Architecture in the Humid Zone*, his is a much more detailed work of reference. It would be surprising if it does not find its way to the shelves of most architects and others concerned with building in the tropics. The book contains nine tables, over one hundred line or half-tone illustrations, and a useful bibliography of nearly fifty titles. It is conveniently arranged into six chapters: warm climates and building design; some structural design considerations; design for comfort; choice of building materials and methods; sites and siting; and house and home.

The author spent three years with the Tropical Section of the U.K. Building Research Station and he also served for a time with the Government of Jamaica as architect in the Housing Department. He freely acknowledges the work in the field of tropical housing which has been done at the Building Research Station. More than thirty of the one hundred and fifty references in the book are to studies made at the Station.

The problem of the designer in a warm climate is the reverse of that in a temperate climate. The main object is to keep the sun out and to ensure the escape of heat from inside. But not all warm climates are the same; the requirements for warm, humid climates are quite different from those of hot, dry climates—not to mention 'mixed' climates of the savannah or monsoon type. The nature of compromise solutions, often necessary in the tropics, is well illustrated by the author's account of conditions in Ceylon.

Earthquakes, hurricanes (or cyclones), expansive soils, infestation of timber by termites, are common features in many parts of the tropics. Mauritius and Jamaica, for example, have each suffered hurricanes in the last ten years. Mr. Oakley devotes quite a part of his chapter on structural design to these problems. In the chapter on design for comfort he puts his finger on a common failing—that is, the use in hot countries of forms and features more suited to temperate countries. How often has one suffered from unnecessary glare or ill-ventilated buildings because no regard has been paid to shading or to correct orientation to the breeze. The author mentions the Effective temperature scale index as a measure of environmental warmth. He does not, however, mention a more recent scale, developed by Mr. C. G. Webb of the Building Research Station, known as the Equatorial comfort index. This is especially applicable in humid climates of low latitudes.

The author devotes considerable space to the chapter on materials and methods; it includes more than fifty useful references. His advice on sites and siting is practical and stems from the needs of different climates. In his last chapter, on house and home, he suggests that much is to be learned from a study of domestic architecture of the past—and sometimes even from unsophisticated builders of the present. One must endorse this advice; if one does, one may often find principles which are valid for to-day.

W. M. WOODHOUSE

THE THATCHERS' CRAFT. *With a foreword by John Betjeman. London, Rural Industries Bureau*, 1961. £2 2s *net*

Scattered over the countryside is an increasing number of well-thatched cottages, houses, barns. Where once there seemed to be nothing but neglect and decay, all is now ordered beauty—or, if that is excessive, a little can be subtracted without any great deflection from truth. It is not, however, very often that the transient sees thatching in process of being carried out, a circumstance that has often awakened my wonder.

The craft is far more complex than is indicated by the apparent simplicity of the results and, while in outline the same wherever thatching is done, the technique varies in accordance with the material used. Since this roof cover is composed of local materials, it has been used ever since houses were built, and may possibly in primitive times have formed the outer cover of walls as well as roofs.

Thatch is made from long straw, that is the straw left over when the grain has been threshed out; but this source of supply has been curtailed by the combine harvester, which breaks up the straw. In the south-western counties this material is refined into combed wheat reed, prepared by a reed comber fixed to the top of the threshing drum. 'It removes the grain and the leaves from the wheat, without the straw going through the drum', and obviously in better condition for use as thatch. Norfolk reed, a thatch familiar to all visitors to the eastern counties, is made from a marshland plant, and is a natural growth harvested not only in Essex and Norfolk, but in tidal estuaries in Dorset, Hampshire, Glamorgan and elsewhere.

Variations in the way in which the thatchers use these different materials are substantial, and the descriptions of the successive stages of the work, from the preparation of the thatch to its final trimming before completion, could hardly be more detailed than they are in this book. The whole is rounded off by a chapter on roof construction for thatch which, it seems, is becoming increasingly popular. Details of the methods of doing the work are shown in a fine collection of photographs.

Thatching is a fine craft, one in which a man can take a pride. The men who do it must acquire a manual dexterity, which can only be admired: but there is another characteristic of the business that makes a hearty appeal to me in relation to my own craft. The thatchers have a venerable language of their own, which includes such expressions as a 'bottle' of straw, sway, yealm, ligget—but the list is too long to quote in full. Both the work and its language are vastly interesting, and both are most competently discussed here—as one now expects from the publications of the Rural Industries Bureau.

G. E. FUSSELL

LIBRARY ADDITIONS

Fellows and Associates are reminded that they may borrow up to five books at a time from the Library and retain them for a month. Members living outside London may borrow books by post. Books sent by post are despatched at the cost of the Society and returned at the cost of the borrower. Books marked with an asterisk are part of the reference library, and not normally available for loan.

INDUSTRIAL AND COMMERCIAL ART AND DESIGN

CARNEY, CLIVE—Impact of design. *London, Angus & Robertson*, 1959.

CARNEY, CLIVE—International interiors and design: outstanding achievements by leading architects, interior designers and decorators of the world. *London, Angus & Robertson*, 1959.

HISTORY AND TOPOGRAPHY

PEVSNER, NIKOLAUS—Buckinghamshire. *Harmondsworth, Penguin Books*, 1960. (*Buildings of England Series.*)

ROLT, LIONEL THOMAS CASWELL—The Cornish giant: the story of Richard Trevithick, father of the steam locomotive. *London, Lutterworth Press*, 1960.

ROLT, LIONEL THOMAS CASWELL—George and Robert Stephenson: the railway revolution. *London, Longmans, Green*, 1960.

RUSSELL, JOHN—Paris; with photographs by Brassaï. *London, Batsford*, 1960.

THOMAS, NICHOLAS—A guide to prehistoric England. *London, Batsford*, 1960.

UNWIN, GEORGE—The Gilds and companies of London. *London, Methuen*, 1908.

WATSON, J[OHN] STEVEN—The reign of George III, 1760-1815. *Oxford, Clarendon Press*, 1960. (*Oxford history of England, edited by Sir George Clark*, Vol. 12.)

WINSTONE, REECE—Bristol in the 1890s [preface by Donald Hughes]. *Bristol, R. Winstone*, 1960. Presented by the author.

FROM THE JOURNAL OF 1861

VOLUME X. *22nd November*

THE WORK AND INFLUENCE OF THE SOCIETY

[*From the Inaugural Address of the 108th Session, delivered by the Chairman of Council, Sir Thomas Phillips, F.G.S., on 20th November.*]

In former addresses from this place I indicated the important service the members might render to the Society by introducing amongst us active, ardent, and intelligent men, willing to co-operate with the Council in increasing the influence of a Society which includes many agencies for promoting the well-being of the community. But we do not appeal to our members alone. Our Board of Examiners and our Committees undertake duties of a laborious character, and contribute in various ways and different degrees to the usefulness of the Society.

In a career which now embraces the labours of more than a century, the Society has witnessed many vicissitudes, but although some of its original functions have been undertaken by kindred societies, yours is the only chartered body which seeks to promote manufactures and commerce by enlisting in their service science and art. By your union with Mechanics' and other Institutions, and by the encouragement you have afforded to the systematic instruction of adults, you have lengthened your cords and strengthened your stakes. The number of your members has doubled in the last ten, and quadrupled in the last fifteen years. The last Session witnessed the election of 548 new members, and the Council has had this evening the gratification of notifying the proposal of 306 candidates for election, being nearly thrice the number ever submitted for election at a single sitting. These are proofs that the Society continues to enjoy the sympathy, confidence, and esteem of the public, and they deserve the grateful acknowledgements of the Council.

Increased influence brings increased responsibility as well to societies as to individuals, and we shall be judged hereafter not by the extent of our means of usefulness, but by the manner in which those means have been employed. May it be our constant endeavour to overcome prejudice, secure improvements, advance physical science, and promote social ameliorations. The employment of science in advancing the arts which minister to man's necessities is the characteristic of our age, and when we regard the rapid stimulus thus given to the industrial progress of the nation, we may, in the language of Bacon, say, 'No doubt the sovereignty of man lieth hid in knowledge wherein many things are reserved which kings with their treasure cannot buy, nor with their force command.'

Some Activities of Other Societies and Organizations

MEETINGS

WED. 1 NOV. Electrical Engineers, Institution of, Savoy Place, W.C.2. 6 p.m. H. J. H. Sketch: *Generation of power in satellites.*

The Newcomen Society, at Science Museum, S.W.7. 5.30 p.m. P. J. Booker: *Gaspard Monge (1746–1818) and his effect on engineering drawing and technical education.*

THURS. 2 NOV. Refrigeration, Institute of, at National College for Heating, Ventilating, Refrigeration and Fan Engineering. 7 p.m. J. E. Kumler: *Modern designs in thermostatic control for refrigeration, including air-conditioning, automatic defrosting and heat pump applications.*

Royal Commonwealth Society, Northumberland Avenue, W.C.2. 1.15 p.m. Sir Duncan Cumming: *Aviation in Africa.*

FRI. 3 NOV. Electrical Engineers, Institution of, Savoy Place, W.C.2. 6 p.m. Professor D. M. Mackay: *Information theory in relation to biology.*

SAT. 4 NOV. Horniman Museum, London Road, Forest Hill, S.E.23. 3.30 p.m. Frank W. Land: *Kingdom of the octopus.*

MON. 6 NOV. Commonwealth Institute, S. Kensington, S.W.7. 5.45 p.m. Lancelot Clark: *North-west frontier: land of the Pathans.*

Road Transport Engineers, Institute of, at The Engineers Club, Albert Square, Manchester. 7.30 p.m. J. G. Dickie: *Relations between management and staff in the transport industry.*

TUES. 7 NOV. Manchester Geographical Society, 16 St. Mary's Parsonage, Manchester. 6.30 p.m. Dr. J. S. Duncan: *The two Australias.*

Mechanical Engineers, Institution of, 1 Birdcage Walk, S.W.1. 6 p.m. Discussion: *Refrigeration lubrication.*

WED. 8 NOV. British Kinematograph Society, at Shell-Mex House, W.C.2. 7.30 p.m. B. J. Davies: *Modern practical sensitometry.*

Mechanical Engineers, Institution of, 1 Birdcage Walk, S.W.1. 6 p.m. Dr. H. E. Merritt: *Gear-tooth contact phenomena.*

Radio Engineers, British Institution of, 9 Bedford Square, W.C.1. 6 p.m. E. L. Gregory and E. A. Piper: *Electronics in chromatography.*

Victoria & Albert Museum, S. Kensington, S.W.7. 6.15 p.m. Hugh Wakefield: *Victorian glass.*

THURS. 9 NOV. Royal Commonwealth Society, Northumberland Avenue, W.C.2. 1.15 p.m. Professor L. F. Rushbrook Williams: *Basic democracies in Pakistan.*

FRI. 10 NOV. British Interplanetary Society, at Royal Aeronautical Society, 4 Hamilton Place, W.1. 6.30 p.m. R. Hall: *Photography from rockets and satellites.*

Chemical Society, at The University, Birmingham. 4.30 p.m. Professor D. H. Everett: *Physical adsorption.*

Engineers, Junior Institution of, Pepys House, 14 Rochester Row, S.W.1. R. M. Cooper: *Food at zero.*

Royal Institution, 21 Albemarle Street, W.1. Dr. W. S. Bullough: *Modern research on the skin of mice and men.*

MON. 13 NOV. Commonwealth Institute, S. Kensington, S.W.7. 5.45 p.m. Major J. M. Devereux-Colebourn: *Tanganyika Safari.*

Transport, Institute of, at Institution of Civil Engineers Great George Street, S.W.1. 5.45 p.m. The Rt. Hon. Viscount Simon: *Seaports as links in the transport chain.*

TUES. 14 NOV. Chemical Society, at Manchester College of Science & Technology, Manchester. 6.30 p.m. Professor G. B. Kistiakowski: *Some reactions of free radicals.*

Textile Institute, at Chemical Society, Burlington House, W.1. 6.30 p.m. Dr. G. H. Elliot: *Progress in bonded fabrics.*

Textile Institute, at 10 Blackfriars Street, Manchester 3. 7 p.m. H. A. C. Todd: *The Ulster approach to the spinning of man-made fibres.*

WED. 15 NOV. British Kinematograph Society, at Central Office of Information, Hercules Road, S.E.1. 7.30 p.m. J. M. Waldram: *Cine photography in the study of drivers' visual problems.*

Engineering Inspection, Institution of, at Birmingham Exchange and Engineering Centre, Stephenson Place, Birmingham. 6.30 p.m. B. G. Carver: *Spark machining and its applications.*

Radio Engineers, British Institution of, 9 Bedford Square, W.C.1. 6 p.m. C. M. Cade: *Infra-red applications in navigation.*

Road Transport Engineers, Institute of, at Merton Hotel, Merton Road, Bootle, Liverpool 20. 7.30 p.m. D. Macdonald-Walker: *Materials handling—its equipment and maintenance.*

THURS. 16 NOV. Chemical Society, at Royal Technical College, Salford. 5 p.m. Sir Robert Robinson: *The biogenesis of alkaloids.*

Road Transport Engineers, Institute of, at the Royal Society of Arts. 6.30 p.m. J. L. B. Crane: *Unusual types of trailer suspension including air suspension.*

Royal Commonwealth Society, Northumberland Avenue, W.C.2. 1.15 p.m. Professor W. H. Morris-Jones: *Government and parliament in India.*

FRI. 17 NOV. Engineers, Junior Institution of, Pepys House, 14 Rochester Row, S.W.1. E. E. Burrage: *Some notes on early marine diesel engines.*

MON. 20 NOV. Royal Geographical Society, 1 Kensington Gore, S.W.7. 5 p.m. T. J. Chandler: *London's urban climate.*

WED. 22 NOV. British Interplanetary Society, at Royal Aeronautical Society, 4 Hamilton Place, W.1. 9.30 a.m.–5.30 p.m. Symposium: *Materials in space technology.*

Engineering Inspection, Institution of, at the Royal Society of Arts. 6.15 p.m. C. J. Tanner: *The application of air gauging to high output inspection.*

Victoria & Albert Museum, S. Kensington, S.W.7. 6.15 p.m. W. G. Archer: *The meaning in Indian sculpture.*

THURS. 23 NOV. Royal Commonwealth Society, Northumberland Avenue, W.C.2. 1.15 p.m. The Rt. Hon. Dennis Vosper: *Technical co-operation overseas.*

FRI. 24 NOV. London Society, at the Royal Society of Arts S. E. Dykes Bower: *The repairs at Westminster Abbey since 1953.*

Royal Institution, 21 Albemarle Street, W.1. Dr. P. B. Hirsch: *Seeing atomic defects in metals.*

SAT. 25 NOV. Horniman Museum, London Road, Forest Hill, S.E.23. 3.30 p.m. C. M. Mitchell: *The folk life of the English people.*

MON. 27 NOV. Royal Geographical Society, 1 Kensington Gore, S.W.7. 8.30 p.m. Michael Ward and George Lowe: *Ordeal on Mahalu.*

WED. 29 NOV. British Kinematograph Society, at Central Office of Information, Hercules Road, S.E.1. 7.30 p.m. Dr. R. E. Eastwood and N. R. Phelp: *Radar recording.*

Radio Engineers, British Institution of, 9 Bedford Square, W.C.1. 6 p.m. R. Yorke: *An experimental assessment of loudspeaker performance.*

Victoria & Albert Museum, S. Kensington, S.W.7. 6.15 p.m. The Hon. Richard Hare: *A Russian art collection in America.*

OTHER ACTIVITIES

NOW UNTIL SAT. 18 NOV. Council of Industrial Design, The Design Centre, 28 Haymarket, S.W.1. Exhibition: *Toys at The Design Centre.*

FRI. 3 NOV.–SUN. 3 DEC. Commonwealth Institute, S. Kensington, S.W.7. Exhibition: *Paintings by Trinidad and Tobago artists.*

MON. 6 NOV.–SAT. 18 NOV. I.C.I. Limited, at the Manchester Building Centre. Exhibition: *Plastics in building.*

INDEX TO VOLUME CIX

A

Abrahams, Harold M., *chair*, Sport in the Commonwealth, 279
Ackroyd, Sir Cuthbert, *chair*, The work of the Commonwealth societies, 798
Acton Society Trust, agrees to conduct survey of industrialization in the Hampshire basin, *annual report*, 652
Adams, Mrs. Mary, *disc.*, Ergonomics : fitting the job to the worker, 278; *disc.*, The influence of the Festival of Britain on design to-day, 515 ; *chair*, The presentation of science on television, 927
Adburgham, Jocelyn, *disc.*, Architecture in transport, 448
Addison, Herbert, *disc.*, Human progress and economic growth in the developing countries, 871
Address from the Society to King George III, *see under* Studies in the Society's Archives
Adorian, Paul, *disc.*, The presentation of science on television, 937, 940
Albert medal, *see under* Royal Society of Arts
Alfred Bossom lecture, Architecture in transport, by Dr. F. F. C. Curtis, 434
Alilionwu, R. O. E., *disc.*, Sovereign Nigeria, 539
Allan, D. G. C., *paper*, The history and scope of the Society's library, 105 ; *notes*, An address from the Society to King George III : presented 3rd February, 1761, 228 ; The Society of Arts and the Committee of the Privy Council for Trade, 1786-1815, pt. i, 389 ; pt. ii, 629 ; pt. iii, 807 ; pt. iv, 979 ; *book review*, The papers of Benjamin Franklin, vols. I and II, 734
Allan, William, receives silver medal, 15 ; *book review*, Cyprus then and now, 59
Allen, Cecil J., *Dr. Mann juvenile lecture*, Railways in our time, 298 ; *book review*, Great central : vol. I, the progenitors, 1813-63, 984
Alwyn, William, *chair*, The presentation of music on television, 954
American museum, Claverton manor, Bath, *note*, 542
Anderson, J., *disc.*, Technical advances in packaging, 838, 839
Anglo-German design award, *note*, 730
Architect's approach to engineering in tall buildings, *paper*, by Sir Thomas Bennett, 203
Architecture in transport, *Alfred Bossom lecture*, by Dr. F. F. C. Curtis, 434
Armstrong, Captain D. H. F., *disc.*, The training of officers for the Merchant Navy, 28
Arscott, F. M., *disc.*, The training of scientists and engineers for industry, 794-5
Art and industry, *note*, 50
Automatic door stop, An, *Fothergill prize essay*, by R. E. Sant, 977

B

Baggs, A. C., *disc.*, The function of labour and the trade unions in industry and commerce, 262
Bailey, D. J., *disc.*, Economic developments in Canada, 974
Bailey, J. C., *disc.*, Bauxite and aluminium with particular reference to the Commonwealth, 898
Baker, R. G., *chair*, *Cadman memorial lecture*, The coal mining situation to-day, 77
Bale, A. Powis, *disc.*, Some traffic problems of London, 195 ; *disc.*, Sport in the Commonwealth, 292 ; *disc.*, The timber industry, 493 ; *disc.*, Geography and the business world to-day, 524 ; *disc.*, Photography in industry and commerce, 678 ; *disc.*, Some folklore and history of diamond, 762 ; *disc.*, Bauxite and aluminium with particular reference to the Commonwealth, 896 ; *disc.*, The presentation of science on television, 936-7
Ball, Hugo, *disc.*, Ergonomics : fitting the job to the worker, 278
Barber, Dr. J. H., *disc.*, The modern chemical industry in Great Britain, lecture II, 365
Barnett, W. R. A., *disc.*, Technical advances in packaging, 837
Barry, Sir Gerald, *Peter Le Neve Foster lecture*, The influence of the Festival of Britain on design to-day, 503
Barstow, John, piano recital at annual reception, 133
Bartle, Richard, *disc.*, The influence of the Festival of Britain on design to-day, 514
Barton, A. E. V., *disc.*, Sport in the Commonwealth, 292
Bauxite and aluminium with particular reference to the Commonwealth, *Henry Morley lecture*, by Wilfred Brining, 877.
Bawden, Edward, agrees to design Christmas card, 409
Beaumont, Wing-Cdr. C. L., *disc.*, Sport in the Commonwealth, 295
Beecher, E. R., *disc.*, Wallpaper and its history, 466
Beecroft, Walter, *obituary*, 632
Bell, J. E., *disc.*, Sovereign Nigeria, 536
Belle, J. Cleveland, receives Bicentenary medal for 1960, 143
Benjamin Franklin medal, *see under* Royal Society of Arts
Bennett, Sir Thomas, *paper*, The architect's approach to engineering in tall buildings, 203
Berkovitch, Dr. I., *disc.*, The modern chemical industry in Great Britain, lecture I, 351 ; lecture III, 380
Bernard, Frank R., *disc.*, Architecture in transport, 448-9
Bicentenary medal, *see under* Royal Society of Arts
Bishop, Dr. P. M. F., *disc.*, Photography in medicine, 692
Blackwell, David, *disc.*, Architecture in transport, 448
Blaxter, Dr. K. L., *Fernhurst lecture*, The nutritional physiology of livestock under natural conditions, 764
Blood, Sir Hilary, *vote of thanks*, The Commonwealth association in theory and practice, 729
Blyton, C. J., *disc.*, The presentation of music on television, 967
Boase, T. S. R., *book review*, Catalogue of the Constable collection in the Victoria and Albert Museum, 232
Boden, T. B., *disc.*, The nutritional physiology of livestock under natural conditions, 777
Bolton, Mrs. Felicity, *disc.*, The British contribution to education in Africa, 44

Books, Notes on :
Aeroplane, The, by Charles H. Gibbs-Smith, 312
American negro art, by Cedric Dover, 547
Art in Nigeria, 1960, by Ulli Beier, 547
Artist and his world, The, by Julian Trevelyan, 397
Assyrian palace reliefs . . . , by R. D. Barnett, 238
Atlas of Australian resources (last 5 sheets), 550
Atlas of western civilization, by Dr. van der Meer, 484
Baroque in Spain and Portugal, by James Lees-Milne, 733
Beloved son Felix, trans. by Seán Jennett, 982
Britain's scientific and technological manpower, by George Louis Payne, 310
British industry : change and development in the 20th century, by J. H. Dunning and C. J. Thomas, 634
Business of management, The, by Roger Falk, 737
Canaletto and his contemporaries, by Decio Gioseffi, 234
Catalogue of the Constable collection in the Victoria and Albert Museum, by Graham Reynolds, 232
Controls for outer space, by Philip C. Jessup and Howard J. Taubenfeld, 61
Craftsman's handbook—Il libro dell' arte, by Cennino Cennini, trans, by Daniel V. Thompson, 397
Cyprus then and now, by Gordon Home, 59
Dangerous corner, by Maurice Vlaminck, 548
Decoration and furnishing, by John Wilson, 126
Decorative alphabets and initials, ed. by Alexander Nesbitt, 478
Decorative art, 1960-61, ed. by Terence Davis, 125
Decorative art, 1961-2, ed. by Terence Davis, 901
Discovering medieval art, by G. M. Durant, 398
Exhibition and display, by James Gardner and Caroline Heller, 124
Flickering flames, by Leroy Thwing, 737
Forms of things unknown, The, by Herbert Read, 481
Garages and service stations, by Rolf Vahlefeld and Friedrich Jacques, 483
Great aircraft, by Norman Macmillan, 313
Great central : vol. I, the progenitors, 1813-63, by George Dow, 984
Guide to the stars, by Patrick Moore, 399

Impact of design, by Clive Carney, 311
Intelligence : its evolution and forms, by Gaston Viaud, 482
International interiors and design, by Clive Carney, 311
International poster annual, ed. by Arthur Niggli, 127
Kúniyoshi, by B. W. Robinson, 903
Letter design in the graphic arts, by Mortimer Leach, 478
Literary history of wallpaper, A, by E. A. Entwisle, 235
London the unique city, by Steen Eiler Rasmussen, 812
Looking at pictures, by Kenneth Clark, 233
Louis XVI furniture, by F. J. B. Watson, 480
Masterpieces of Dala peasant painting, by Svante Svårdström, 38
Masterpieces of Greek art, by Raymond V. Schoder, 813
Matter and antimatter, by M. Duquesne, 550
Modern Australian painting and sculpture, produced by Kim Bonython, 57
Modern publicity, 1960-61, ed. by Wilfrid Walter, 635
Modern Russian reader for technical college students, A, ed. by N. S. Fudel', 983
Muntu : an outline of neo-African culture, by Janheinz Jahn, 547
Nature : earth, plants, animals, ed. by James Fisher and others, 317
Papers of Benjamin Franklin, The, vols. I and II, ed. by Leonard Labaree, 734
Pioneers of modern design : from William Morris to Walter Gropius, by Nikolaus Pevsner, 237
Preparation for painting, by Lynton Lamb, 397
Primitive into painter : life and letters of John Toole, by William B. O'Neal, 814
Prize for art, A, by Edward Wakeford, 548
Professional practice for designers, by Dorothy Goslett, 736
Sickert, by Lillian Browse, 314
Subsunk, by W. O. Shelford, 636
Symbols, signs and their meaning, by Arnold Whittick, 396
Thatchers' craft, The, 986
Towards universal man, by Rabindranath Tagore, 633
Tropical houses, by David Oakley, 985
Victorian comfort, a social history of design, by John Gloag, 902
Victorian publisher : a study of the Bentley papers, A, by Royal A. Gettman, 315
Victoriana : a collector's guide, by Violet Wood, 236
Wall Street : the inside story of American finance, by Martin Mayer, 60
Workshop of the world : British economic history from 1820 to 1880, by J. D. Chambers, 815
Books, Short notes on, 484, 637, 738
Borradaile, Rosamund, *book reviews*, The artist and his world, Preparation for painting, The craftsman's handbook—Il libro dell' arte, 397-8
Bossom, Lord, *chair*, *Alfred Bossom lecture*, Architecture in transport, 434 ; *vote of thanks*, *annual general meeting*, 664
Bostock, Alice, *disc.*, Human progress and economic growth in the developing countries, 875
Bourne, Gen. Sir Geoffrey, *disc.*, Bauxite and aluminium with particular reference to the Commonwealth, 896
Bourne, Mrs V. M., *disc.*, Sport in the Commonwealth, 296
Bowen, Mrs. A. V., *disc.*, The work of the Commonwealth societies, 804
Bowes Lyon, Honble. Sir David, *obituary*, 981
Bowler, Stanley W., *disc.*, Technical advances in packaging, 838, 839
Boyd of Merton, Viscount, *chair*, Sovereign Nigeria, 527
Bracewell, Smith, *disc.*, Bauxite and aluminium with particular reference to the Commonwealth, 896
Bracey, Dr. H. E., undertakes survey of industrialization in the Hampshire basin, 652
Bridge, C., *disc.*, Technical advances in packaging, 838-9
Brining, Wilfred, *Henry Morley lecture*, Bauxite and aluminium with particular reference to the Commonwealth, 877
British Association annual meeting, *note*, 545
British contribution to education in Africa, The, *paper*, by Professor L. J. Lewis, 32
Brown, Skipper Albert, awarded Thomas Gray memorial trust silver medal for 1960, 404
Brunel, Christopher, *disc.*, The presentation of the visual arts on television, 951
Buchanan, R. O., *chair*, The future pattern of university education in the United Kingdom, 840
Burgess, C. Gurney, *disc.*, Architecture in transport, 447, 448 ; *disc.*, Photography in education, 707
Burton, Dr. Maurice, *Dr. Mann juvenile lecture*, The myth of the phoenix, 382
Business studies, ordinary national certificate in, 489
Butterell, R. D., *disc.*, Architecture in transport, 449
Buzas, Stefan, appointed R.D.I., 639
Byars, S., *disc.*, Economic developments in Canada, 975

C

Cable, V., receives a Fothergill prize, 16 ; *Fothergill prize essay*, Rescue from crashed fired aircraft, 47
Cabourn, J., *disc.*, The presentation of science on television, 938
Cadman memorial lecture, The coal mining situation to-day, by F. G. Glossop, 77
Canada, High Commissioner for, *see* Drew
Canada Council fellowships, *note*, 51
Canetty, P. E., *disc.*, Technical advances in packaging, 839
CANTOR LECTURES :
1*st Course*. The modern chemical industry in Great Britain, by Dr. James Taylor : syllabus, 72 ; I. Towards a philosophy of the modern chemical industry, 339 ; II. The springs of progress, 353 ; III. The modern chemical industry in Great Britain, 367
2*nd Course*. Modern photography : I. Photography in industry and commerce, by Michael J. Langford, 665 ; II. Photography in medicine, by C. E. Engel, 680 ; III. Photography in education, by Margaret F. Harker, 694
3*rd Course*. The presentation of science and the arts on television : I. The presentation of science, by Dr. Tom A. Margerison, 927 ; II. The presentation of the visual arts, by Basil Taylor, 942 ; III. The presentation of music, by Lionel Salter, 954
Capey, Reco, *obituary*, 731
Carron, W. J., *paper*, The function of labour and the trade unions in industry and commerce, 248 ; awarded silver medal, *annual report*, 658
Carter, Professor C. F., *book review*, British industry : change and development in the 20th century, 634
Carthy, Dr. J. D., *book review*, Intelligence : its evolution and forms, 482
Casson, Sir Hugh, *disc.*, The influence of the Festival of Britain on design to-day, 513
Catlin, Professor George E. Gordon, *Sir George Birdwood memorial lecture*, Rabindranath Tagore, 613
Chalmers, A. J., *disc.*, Wallpaper and its history, 466
Chambliss, John A., *Fothergill prize essay*, A suggested fire alarm, 48 ; endows lecture on landscape gardening, 642
Chapman, Dr. Dennis, address to Society's meeting in Manchester, *announcement*, 819
Charles-Dean, B., *disc.*, Economic developments in Canada, 972
Charleston, W. A. G., *disc.*, The nutritional physiology of livestock under natural conditions, 780
Chipperfield, Guy, *obituary*, 811
Chisnall, Miss M., *disc.*, Learning to read : an experiment, 177, 178
Chubb, Honble. G. C. H., *chair*, The steel industry to-day and tomorrow : a technical review, 579
Civic Trust, three years of the, *note*, 114
Clausen, Hugh, *disc.*, The training of scientists and engineers for industry, 792, 796 ; *disc.*, The future pattern of university education in the United Kingdom, 853-4
Clotworthy, S. E., *chair*, *Henry Morley lecture*, Bauxite and aluminium with particular reference to the Commonwealth, 877
Clubb, Commander E. W., *book review*, Subsunk, 636
Coal mining situation to-day, The, *Cadman memorial lecture*, by F. G. Glossop, 77
Cochran, Alexander, *obituary*, 477
Cochran, Dr. Kenneth D., receives Howard prize for 1960, 15 ; awarded Howard prize for 1961, 910
Cockcroft, Sir John, *Trueman Wood lecture*, The training of scientists and engineers for industry, 782
Cockerell, Christopher, *erratum*, 5 ; receives silver medal, 15

INDEX

Cole, Walton A., judges nominations for Commonwealth journalism award, 406
Collis, Maurice, *book review*, Kuniyoshi, 903
Committee on broadcasting, proposed representations to, 76
Commonwealth association in theory and practice, The, *Sir Thomas Holland memorial lecture*, by Professor J. D. Bruce Miller, 710
Commonwealth film award, presented to High Commissioner for Malaya, 16
Conway, Sub-Officer Antony S., entry for Fothergill prize commended, 911
Cooper, Nigel C., *disc.*, Sport in the Commonwealth, 294-5

CORRESPONDENCE :
Ship model testing in Britain, 124
The development of the aeroplane, 395

Cotton, H. E., *disc.*, Technical advances in packaging, 837
Cowdery, Mrs. E. Mary, *disc.*, The British contribution to education in Africa, 44
Cox, Sir Christopher, *chair*, The British contribution to education in Africa, 32
Crawford, General Sir Kenneth, *obituary*, 394
Cronshaw, Dr. C. J. T., *obituary*, 230
Crosby, A., *disc.*, Bauxite and aluminium with particular reference to the Commonwealth, 896
Cross, Brigadier Lionel, judges nominations for Commonwealth journalism award, 406
Cross, Lieut.-Col. Walter E., *disc.*, Geography and the business world to-day, 525
Culverwell, T. A., *disc.*, The West Indian sugar industry, 104
Currie, Sir William, *disc.*, Training of officers for the Merchant Navy, 29 ; *obituary*, 731
Curtis, Dr. F. F. C., *Alfred Bossom lecture*, Architecture in transport, 434
Cusworth, Mrs. Howard, *disc.*, Bauxite and aluminium with particular reference to the Commonwealth, 898

D

Daley, Sir Allen, *chair*, Human progress and economic growth in the developing countries, 857
Dalton, Dr. G. C. J., *obituary*, 811
Dangerfield, R. E., *vote of thanks*, Some traffic problems of London, 202
Davey, Revd. F. N., *book review*, Atlas of western civilization, 484
Davies, G. Vivian, *disc.*, Some traffic problems of London, 194-5 ; *disc.*, The function of labour and the trade unions in industry and commerce, 257, 261, 262 ; *disc.*, The steel industry to-day and tomorrow : a technical review, 593
Davies, Robert H., receives silver medal, 16
Davis, Alec, *disc.*, The influence of the Festival of Britain on design to-day, 515
Davis, Peter, *disc.*, Photography in medicine, 692-3
Day, Robin, *book review*, Exhibition and display, 124
De Forest, Dr. Lee, *obituary*, 732
De La Warr, Earl, attends Council dinner, 488 ; *paper*, The work of the Commonwealth societies, 798
Derby, Miss Elizabeth, *disc.*, The coal mining situation to-day, 90
Design Centre awards, 1961, *note*, 545
Desmond, Shaw, *obituary*, 231
Development of the aeroplane, *letter* from Oswald Short, 395
Devonshire, Duke of, *chair*, *Sir George Birdwood memorial lecture*, Rabindranath Tagore, 613
Dick, Alick, awarded Benjamin Franklin medal for 1961, 134
Dick, Sir William Reid, *obituary*, 980
Diringer, Dr. D., *disc.*, Learning to read : an experiment, 179
Dodds, Sir Charles, *chair*, Photography in medicine, 680
Dodds, Jackson, *obituary*, 546
Dougall, George, *disc.*, The presentation of science on television, 940
Downing, J. A., *disc.*, Learning to read : an experiment, 178, 180
Drew, H.E. the Honble George A. (High Commissioner for Canada), accepts R. B. Bennett Commonwealth prize on behalf of Dr. Steacie, 15 ; *Neil Matheson McWharrie lecture*, Economic developments in Canada, 968
Drew, Miss Jane, *disc.*, The British contribution to education in Africa, 45
Durrant, D. W., *book review*, Flickering flames, 737
Dyson, F. P., *disc.*, The economic development of the U.K. steel industry, 611

E

Eames, Charles, *eulogy of* and presentation of R.D.I. diploma, 143-4
East India Association, associated with the Society in Tagore centenary celebrations, 322
Economic development of the U.K. steel industry, The., *paper*, by Sir Robert Shone, 595
Economic developments in Canada, *Neil Matheson McWharrie lecture*, by H. E. the Honble. George A. Drew, 968
Edinburgh, H.R.H. the Duke of, visits Society's house, 132 ; *annual report*, 644
Edmund Rich Memorial lecture (First), Welfare and the English school, by W. F. Houghton, 567 ; biennial juvenile lecture instituted, 642, 741
Educational film centre, *note*, 117
Edwards, Sir George, *disc.*, and *vote of thanks*, The function of labour and the trade unions in industry and commerce, 260, 261
Elvin, Dr. H. L., *disc.*, Learning to read : an experiment, 176
Emmerson, Sir Harold, *disc.*, The timber industry, 500
Endowed prizes, *see Fothergill prize, Howard prize*
Engel, C. E., *Cantor lecture*, Photography in medicine, 680
Entwisle, E. A., *paper*, Wallpaper and its history, 450
Ergonomics : fitting the job to the worker, *paper*, by Dr. C. B. Frisby, 265
Etim, Miss A. A., *disc.*, Sovereign Nigeria, 538
Examinations, *see under* Royal Society of Arts

EXHIBITIONS :
Age of Charles II, The (R.A. winter exhibition), 115
American museum, Claverton manor, Bath, 542
'Architecture to-day', 628
Art in Roman Britain, 476
Emil Buhrle collection, 899
Epstein, Jacob (Edinburgh Festival), 899
Epstein, Jacob (London), 979
Factory equipment, 730
Five centuries of printing history, 730
Historic books on mining and kindred subjects, 52
International exhibition of modern jewellery 1890-1961, 228
Landseer, Sir Edwin, 387
Modern French bookbinding, 389
Philipson, Robin, 900
Reynolds, Sir Joshua, 386
Romney, George, 628
Royal Academy Summer Exhibition, 544
Steer, Wilson, 52
Thyssen-Bornemisza collection, 388
Toulouse-Lautrec, 307
Traffic control, modern methods of, 900
Treasures of Trinity College, Dublin, 227

F

Faiz, M. Saeed, *disc.*, The Commonwealth association in theory and practice, 728
Faraday, Derek, *disc.*, The presentation of science on television, 937
Farina, Pinin, to design motor cars for The Queen's visit to Italy, *note*, 308
Farr, Michael, *disc.*, The presentation of the visual arts on television, 951
Fay, I. W., *disc.*, The economic development of the U.K. steel industry, 611
Fearnley, Thomas, *obituary*, 477
Fell, J. R., *disc.*, The nutritional physiology of livestock under natural conditions, 776
Ferguson, Harry, *obituary*, 56
Fernhurst lecture, The nutritional physiology of livestock under natural conditions, 764
Fforde, Sir Arthur, *chair*, Learning to read : an experiment, 149
Finigan, R. J., *disc.*, The Commonwealth association in theory and practice, 727-8

Finley, D. J., *book review*, Modern Australian painting and sculpture, 57 ; *disc.*, The work of the Commonwealth societies, 804
Fire alarm, A suggested, *Fothergill prize essay*, by John A. Chambliss, 48
Fleck, Sir Alexander, *chair*, The modern chemical industry in Great Britain, lecture III, 367
Florey, Sir Howard, guest of honour at annual reception, 323
Food science and technology, first international congress of, *note*, 730
Ford, Mr., *disc.*, Learning to read : an experiment, 178
Foster, Peter Le Neve, *chair*, Photography in industry and commerce, 665
Foster, Richard G., receives silver medal, 16
Fothergill prize, 1960 : presentation to V. Cable, 16 ; *essays*, Rescue from crashed fired aircraft, by V. Cable, 47 ; A suggested fire alarm, by John A. Chambliss, 48; 1961: *announcement*, 135 ; awarded to R. E. Sant, 910 ; his *essay*, An automatic door stop, 977
Francey, John B., *appendix to disc.*, The training of scientists and engineers for industry, 797
Frater, J. W., *disc.*, The nutritional physiology of livestock under natural conditions, 777
Fred Cook memorial lecture, The restoration portrait, by Oliver Millar, 410
Friese-Greene, P. H., *disc.*, The presentation of music on television, 965
Frisby, Dr. C. B., *paper*, Ergonomics : fitting the job to the worker, 265 ; awarded silver medal, *annual report*, 658
Fry, E. Maxwell, *note*, Three years of the Civic Trust, 114 ; appointed Society's representative on Architect's Registration Council Board of Education, 137 ; *appreciation* of Walter Gropius, 554
Fry, Richard, *book review*, Wall Street : the inside story of American finance, 60
Fulton, J. S., *paper*, The future pattern of university education in the United Kingdom, 840 ; awarded silver medal, *annual report*, 658
Function of labour and the trade unions in industry and commerce, *paper*, by W. J. Carron, 248
Fussell, G. E., *book review*, The thatchers' craft, 986
Future pattern of university education in the United Kingdom, The, *paper*, by J. S. Fulton, 840

G

Gagnon, Honble. Onesime, *obituary*, 981
Garbett, Captain L. G., *chair*, *Thomas Gray memorial lecture*, The training of officers for the Merchant Navy, 17 ; resigns chair of Thomas Gray memorial trust committee, 327
Garner, F. H., *disc.*, The nutritional physiology of livestock under natural conditions, 775, 780
Garrould, G. W. C., *address* to All-India Bengali literary conference on Rabindranath Tagore, 304-7
Gbaja-Biamila, M. K., *disc.*, Sovereign Nigeria, 536
Geography and the business world to-day, *paper*, by Lord Nathan, 516
Gibbs-Smith, C. H., *book review*, Great aircraft, 313
Gilbert, John, *disc.*, The presentation of science on television, 940
Glass, Dudley, *disc.*, The presentation of music on television, 964
Glen, Peter, awarded Paxton memorial trust bursary, 135
Gloag, John, *book review*, International poster annual, 127 ; *vote of thanks*, Special meeting, 147
Glossop, F. G., *Cadman memorial lecture*, The coal mining situation to-day, 77
Godfrey-Gilbert, Jack, *disc.*, The influence of the Festival of Britain on design to-day, 513, 515
Goodale, Sir Ernest, *disc.*, The presentation of the visual arts on television, 950
Goodden, Professor R. Y., introduces new R.D.I.s, 139-43 ; *chair*, *Peter Le Neve Foster lecture*, The influence of the Festival of Britain on design to-day, 503
Goodeve, Sir Charles, *disc.*, The economic development of the U.K. steel industry, 610
Gooding, Dr. Stanley, *chair*, The modern chemical industry in Great Britain, lecture I, 339
Goodman, L. Landon, *disc.*, The training of scientists and engineers for industry, 794
Gordine, Dora, panel for Esso refinery, *note*, 50
Gordon, Garnet H. (Commissioner for West Indies), *chair*, The West Indian sugar industry, 91
Gould, Sir Ronald, attends Council dinner, 488
Gray, Milner, *chair*, Technical advances in packaging, 821
Green, Squadron-Leader N. Denyer, *disc.*, The work of the Commonwealth societies, 804
Gribble, Mrs. E. M., *obituary*, 123
Griffin, E. J., *disc.*, The architect's approach to engineering in tall buildings, 222
Griffin, L. J., *disc.*, The timber industry, 500, 501
Griffiths, T. W., *disc.*, The nutritional physiology of livestock under natural conditions, 777
Gropius, Professor Walter, awarded Albert medal for 1961, 553
Gunn, W. F., *disc.*, The future pattern of university education in the United Kingdom, 852

H

Haggar, Reginald G., *book review*, Masterpieces of Greek art, 813
Haggarty, John, *disc.*, The presentation of science on television, 938
Hale, Alan, *disc.*, The future pattern of university education in the United Kingdom, 856
Halsbury, Earl of, *chair*, Ergonomics : fitting the job to the worker, 265
Hammond, W. H., scrutinizes ballot, *annual general meeting*, 663
Hancock, E. G., *disc.*, The modern chemical industry in Great Britain, lecture III, 381
Hankinson, F. W., *disc.*, The nutritional physiology of livestock under natural conditions, 775
Harbour, B. H., *disc.*, Some traffic problems of London, 197
Harker, Margaret F., *Cantor lecture*, Photography in education, 694
Harper, Sir Kenneth, *obituary*, 309
Harrison, N. K., *disc.*, Photography in education, 708
Harrison, Dr. V. G. W., *paper*, Technical advances in packaging, 821
Harrison, W. L. S., *disc.*, The training of officers for the Merchant Navy, 29 ; *erratum*, 75
Havinden, Ashley, *book review*, Modern publicity, 1960-61, 635
Hayes, John, *book review*, London, the unique city, 812
Henry Morley lecture, Bauxite and aluminium with particular reference to the Commonwealth, by Wilfred Brining, 877
Hewitt, M. C. P., *disc.*, The function of labour and the trade unions in industry and commerce, 262
Higgens, Humphrey, *book reviews*, Dangerous corner, A prize for art, 348 ; A modern Russian reader for technical college students, 983
Hiley, Richard, *book review*, Baroque in Spain and Portugal, 733
Hilldrup, Professor R. L., *notes*, A campaign to promote the prosperity of colonial Virginia : pt. (ii), 52 ; pt. (iii), 117
Hilton, W. F., *book review*, Guide to the stars, 399
Him, George, *disc.*, The influence of the Festival of Britain on design to-day, 512
Hinton, Sir Christopher, receives silver medal, 14
Historical factors in the development of Canadian nationalism, *address*, by Dr. W. Stanford Reid, 468
History and scope of the Society's library, The, *paper*, by D. G. C. Allan, 105
Hitchcock, William J. J., awarded Society's bronze medal (Royal Drawing Society's exhibition), 475
Hodgson, J. B., *disc.*, The work of the Commonwealth societies, 803
Hoffman, E. T. S., *disc.*, The future pattern of university education in the United Kingdom, 852
Hogarth, C. A., *disc.*, The training of scientists and engineers for industry, 795
Hogg, A. W., *disc.*, Some traffic problems of London, 200
Hohler, Christopher, *book review*, Discovering medieval art, 398
Holford, Sir William, receives silver medal, 14
Holland, Dr. R. W., *chair*, The history and scope of the Society's library, 105
Holmes, J., *disc.*, The steel industry to-day and tomorrow: a technical review, 593
Holwell, Alan, *disc.*, Architecture in transport, 446
Hooper, Sir Frederick, guest of honour at Council dinner, 74
Hope, Lord John, *chair*, The architect's approach to engineering in tall buildings, 203

INDEX

Hope, Robin, *disc.*, The architect's approach to engineering in tall buildings, 224
Hopkins, Iris, *disc.*, Some folklore and history of diamond, 763, 764
Horner, David G., receives silver medal, 16
Houghton, W. F., *First Edmund Rich memorial lecture*, Welfare and the English school, 567
Howard prize for 1960, presented to Dr. Kenneth D. Cochran, 15 ; for 1961, awarded to Dr. Cochran, 910
Howe, Jack, appointed R.D.I., 639
Hughes, G. Bernard, *note*, The American museum in Britain, Claverton Manor, Bath, 542
Hughes, Therle, *book reviews*, Victoriana : a collector's guide, 236 ; Victorian comfort : a social history of design, 902
Human progress and economic growth in the developing countries, *paper*, by M. G. Ionides, 857
Hume, Sir Nutcombe, *book review*, The business of management, 737
Hunt, J. L. A., *annual general meeting*, 659 ; scrutinizes ballot, 663
Hunting, C. P. M., *disc.*, Human progress and economic growth in the developing countries, 873
Hutchison, Bruce, award for Journalism in the Commonwealth, 405-6
Hutchison, Captain W. M., 231
Hutton, C. W., *disc.*, Architecture in transport, 446
Hyde, M. C., *disc.*, The modern chemical industry in Great Britain, lecture III, 379

I

Inchbald, Michael, *book review*, Decoration and furnishing, 126
Industrial design (engineering), new Leverhulme award in, *note*, 806
Industrialization and the countryside (Hampshire basin), Society initiates survey of, 652
Influence of the Festival of Britain on design to-day. *Peter Le Neve Foster lecture*, by Sir Gerald Barry, 503
Ingram, Beresford, *disc.*, Welfare and the English school, 577
Innes, John, *obituary*, 900
Institution of Plant Engineers, joint meeting with, 203
international association of hydraulic research, British section of, *note*, 546
International carpet design competition, *note*, 226
Ionides, M. G., *paper*, Human progress and economic growth in the developing countries, 857

J

Jacobs, I. (Bursaries officer), *note*, New diploma in art and design, 116
James, D., *disc.*, The architect's approach to engineering in tall buildings, 221
Joiner, Leon, *disc.*, Wallpaper and its history, 466
Jones, Sir Cyril, *obituary*, 900
Jones, J. S. M., *disc.*, The steel industry to-day and tomorrow : a technical review, 593 ; *disc.*, The economic development of the U.K. steel industry, 609
Journalism in the Commonwealth, award for, *see under* Royal Society of Arts
Junner, G. Mackenzie, *disc.*, Photography in industry and commerce, 679

K

Kay, R. M., *disc.*, Ergonomics : fitting the job to the worker, 277
Kell, J. R., *disc.*, The architect's approach to engineering in tall buildings, 223
Kemp-Welch, Joan, *disc.*, The presentation of music on television, 964, 967
Kenyatta, Peter, *disc.*, Sovereign Nigeria, 536, 537
Keynes, Sir Geoffrey, *book review*, Beloved son Felix, 982
King, J. A. C., *disc.*, Some traffic problems of London, 199
Kirby, Sir Arthur, *disc.*, The British contribution to education in Africa, 45
Knollys, Viscount, *chair*, The function of labour and the trade unions in industry and commerce, 248
Kotun, M. Ola, *disc.*, Sovereign Nigeria, 538
Krishnan, Sir Kariamanikkam, *obituary*, 732

L

Lammer, A., *disc.*, Photography in education, 707
Langford, Michael J., *Canter lecture*, Photography in industry and commerce, 665
Larger than life, *oration*, by A. B. Read, 144
Latham, Brian, *disc.*, The timber industry, 499, 501
Lawson, D. I., judges Fothergill prize entries, 910
Learning to read : an experiment, *paper*, by I. J. Pitman, 149
Leverhulme research awards, *note*, 52
Levitt, Henry, *disc.*, The function of labour and the trade unions in industry and commerce, 259
Levy, Dr. I., *disc.*, The modern chemical industry in Great Britain, lecture I, 352
Lewenhak, H. K., *disc.*, The presentation of music on television, 965
Lewis, Fred, *disc.*, The presentation of music on television, 965-6
Lewis, Dr. H. E., *disc.*, The nutritional physiology of livestock under natural conditions, 779
Lewis, Professor L. J., *paper*, The British contribution to education in Africa, 32 ; awarded silver medal, *annual report*, 658
Liddiard, Dr. E. A. G., *disc.*, The modern chemical industry in Great Britain, lecture II, 364
Lighthill, M. J., *disc.*, The future pattern of university education in the United Kingdom, 853
Lissim, Professor Simon, luncheon in honour of, 137, 323 ; first overseas vice-president to attend meeting of Council, 557
Lister, Lt.-Col. D. S., *disc.*, Sport in the Commonwealth, 293
Littlewood, Leslie, *disc.*, The function of labour and the trade unions in industry and commerce, 259
Lloyd, Major-General C., attends Council dinner, 488
Lord Mayor of London, *see* Waley-Cohen
Loweth, Sidney, appointed Society's representative on the R.I.B.A. board of architectural education, 326
Lowthian, H. G., *paper*, The function of labour and the trade unions in industry and commerce, 258
Luckhurst, Dr. K. W. (Secretary), visit to North America, 324 ; *annual report*, 647
Lucking, Eric, *disc.*, The influence of the Festival of Britain on design to-day, 515
Luke, G. T., entry for Fothergill prize commended, 911
Lunn, Edward, *obituary*, 981

M

Maass, Dr. Otto, *obituary*, 811
McCance, Sir Andrew, *paper*, The steel industry to-day and tomorrow : a technical review, 579
McGowan, Lord, *obituary*, 810
MacKeith, Dr. R., *disc.*, Photography in medicine, 691
McMeekin, R. D., *disc.*, Architecture in transport, 447
Macnair, Brigadier J. L. P., *disc.*, Learning to read : an experiment, 178 ; *disc.*, The influence of the Festival of Britain on design to-day, 513
McPartlin, G. A., *paper*, Sport in the Commonwealth, 279
Macpherson, A. G., *disc.*, The economic development of the U.K. steel industry, 608
Macpherson, Sir John, attends Council dinner, 488 ; *paper*, Sovereign Nigeria, 527 ; awarded silver medal, *annual report*, 658
Malaya, High Commissioner for, *see* Ya'acob
Mann, Dr., juvenile lectures, announcement, 4 ; Railways in our time, by Cecil J. Allen, 298 ; The myth of the phoenix, by Dr. Maurice Burton, 382
Mann, Miss M. G., *disc.*, The modern chemical industry in Great Britain, lecture III, 380
Mann, Miss S. A., *disc.*, The modern chemical industry in Great Britain, lecture III, 380
Marchand, Baron Georges, *obituary*, 733
Margerison, Dr. Tom, *Canter lecture*, The presentation of science on television, 927
Marland, E. A., *disc.*, Photography in industry and commerce, 678 ; *disc.*, Photography in medicine, 692
Marshall, Kenneth, *disc.*, The economic development of the U.K. steel industry, 611
Marshall, R. F., *disc.*, The training of scientists and engineers for industry, 796
Marskell, W. G., *disc.*, The coal mining situation to-day, 90
Marx, Enid, *book reviews*, Masterpieces of Dala peasant painting, 58 ; Art in Nigeria, 1960, American negro art, 547

Masefield, Peter G., *book review*, The aeroplane, 313
Maunsell, G. A., *obituary*, 733
Maxwell-Hyslop, Mrs. K. R., *book review*, Assyrian palace reliefs, and their influence on the sculptures of Babylonia and Persia, 238
Medals for papers, *annual report*, 658

MEETINGS, COMMONWEALTH :
1st meeting. The British contribution to education in Africa, by Professor L. J. Lewis, 32
2nd meeting. The West Indian sugar industry, by Peter Runge, 91
3rd meeting. Sport in the Commonwealth, by G. A. McPartlin, 279
4th meeting. Photography and exploration in the Himalayas (*not published*)
5th meeting. Sovereign Nigeria, by Sir John Macpherson, 527
6th meeting. *Sir Thomas Holland memorial lecture.* The Commonwealth association in theory and practice, by Professor J. D. Bruce Miller, 710
7th meeting. The work of the Commonwealth societies, by Earl De La Warr, 798
8th meeting. *Sir George Birdwood memorial lecture.* Rabindranath Tagore, by Professor George E. Gordon Catlin, 613
9th meeting. *Neil Matheson McWharrie lecture.* Economic developments in Canada, by H. E. the Honble. George A. Drew, 969
10th meeting. *Henry Morley lecture.* Bauxite and aluminium with particular reference to the Commonwealth, by Wilfred Brining, 877

MEETINGS, ORDINARY :
1st meeting. *Inaugural address.* 'This England' : change in a lifetime, by Oswald P. Milne, 8
2nd meeting. *Thomas Gray memorial lecture.* The training of officers for the Merchant Navy, by Captain G. W. Wakeford, 17
3rd meeting. *Cadman memorial lecture.* The coal mining situation to-day, by F. G. Glossop, 77
4th meeting. Learning to read : an experiment, by I. J. Pitman, 149
5th meeting. Some traffic problems of London, by A. Samuels, 181
6th meeting. The architect's approach to engineering in tall buildings, by Sir Thomas Bennett, 203
7th meeting. The function of labour and the trade unions in industry and commerce, by W. J. Carron, 248
8th meeting. Ergonomics : fitting the job to the worker, by Dr. C. B. Frisby, 265
9th meeting. *Fred Cook memorial lecture.* The restoration portrait, by Oliver Millar, 410
10th meeting. *Alfred Bossom lecture.* Architecture in transport, by Dr. F. F. C. Curtis, 434
11th meeting. Wallpaper and its history, by E. A. Entwisle, 450
12th meeting. The timber industry, by Rodney Perry, 490
13th meeting. *Peter Le Neve Foster Lecture.* The influence of the Festival of Britain on design to-day, 503
14th meeting. Geography and the business world to-day, by Lord Nathan, 516
15th meeting. *First Edmund Rich memorial lecture.* Welfare and the English school, by W. F. Houghton, 567
16th meeting. The steel industry to-day and to-morrow : a technical review, by Sir Andrew McCance, 579
17th meeting. Some folklore and history of diamond, by Professor S. Tolansky, 743
18th meeting. The economic development of the U.K. steel industry, by Sir Robert Shone, 595
19th meeting. *Fernhurst lecture.* The nutritional physiology of livestock under natural conditions, by Dr. K. L. Blaxter, 764
20th meeting. *Trueman Wood lecture.* The training of scientists and engineers for industry, by Sir John Cockcroft, 782
21st meeting. Technical advances in packaging, by Dr. V. G. W. Harrison, 821
22nd meeting. The future pattern of university education in the United Kingdom, 840
23rd meeting. Human progress and economic growth in the developing countries, by M. G. Ionides, 857

MEETINGS, SPECIAL :
The history and scope of the Society's library, by D. G. C. Allan, 105
Presentation of R.D.I. Diplomas and Bicentenary medal, with an *oration*, Larger than life, by A. B. Read, 139
Historical factors in the development of Canadian nationalism, 468
Mercer, F. A., moves adoption of accounts, *annual general meeting*, 661
Mercer, G. E. (Deputy Secretary), *disc.*, The training of scientists and engineers for industry, 795
Mermikides, Miss D. L., *disc.*, The modern chemical industry in Great Britain, lecture III, 379
Meynell, Sir Francis, *book reviews*, Letter design in the graphic arts, Decorative alphabets and initials, 478
Middleton, Michael, *note*, Toulouse-Lautrec at the Tate gallery, 307 ; *book review*, The forms of things unknown, 481
Millar, Oliver, *Fred Cook memorial lecture*, The restoration portrait, 410
Millard, Dr. R. S., *disc.*, Human progress and economic growth in the developing countries, 874
Miller, D. J., *disc.*, The steel industry to-day and to-morrow : a technical review, 592
Miller, Professor J. D. Bruce, *Sir Thomas Holland memorial lecture*, The Commonwealth association in theory and practice, 710
Mills, Lord, *chair*, The economic development of the U.K. steel industry, 595
Mills, Edward D., *book review*, Garages and service stations, 483
Milne, Oswald P., *Inaugural address*, 'This England' : change in a lifetime, 8 ; *vote of thanks*, The training of officers for the Merchant Navy, 31 ; *chair*, special meeting, 138 ; presents Bicentenary medal to J. Cleveland Belle, 139 ; *vote of thanks*, The architect's approach to engineering in tall buildings, 226 ; *disc.*, The modern chemical industry in Great Britain, lecture III, 380 ; Industrial art bursaries exhibition opening, 487 ; *disc.*, The timber industry, 500 ; *chair*, Geography and the business world to-day, 516 ; *vote of thanks*, Rabindranath Tagore, 628 ; *chair*, *annual general meeting*, 643 ; *chair*, *Trueman Wood lecture*, The training of scientists and engineers for industry, 782 ; *disc.*, The work of the Commonwealth societies, 805 ; *vote of thanks*, 806 ; *vote of thanks*, Economic developments in Canada, 976
Mitchell, W. A., *disc.*, Architecture in transport, 449
Modern chemical industry in Great Britain, The, *Cantor lectures*, by Dr. James Taylor : I. Towards a philosophy of the modern chemical industry, 339 ; II. The springs of progress, 353 ; III. The modern chemical industry in Great Britain, 367
Modern photography, *Cantor lectures :* I. Photography in industry and commerce, by Michael J. Langford, 665 ; II. Photography in medicine, by C. E. Engel, 680 ; III. Photography in education, by Margaret F. Harker, 694
Monro, Miss Helen, receives silver medal, 15
Montgomery, J. A., *disc.*, The nutritional physiology of livestock under natural conditions, 778-9
Montreal, first official gathering of Fellows in, 325 ; *address*, Historical factors in the development of Canadian nationalism, by Dr. W. Stanford Reid, 468
Moon, Dr. F. E., *disc.*, The nutritional physiology of livestock under natural conditions, 776
Moore, J. P., *disc.*, The training of scientists and engineers for industry, 793
Moore, Patrick, *book review*, Controls for outer space, 61
Morgan, C. D., *disc.*, Some traffic problems of London, 197, 198
Morgan, J. Gwyn, *disc.*, The future pattern of university education in the United Kingdom, 856
Morison, Stanley, receives R.D.I. diploma, 149-50
Morris, Barbara, *book review*, A literary history of wallpaper, 235
Morris, Dr. D. G. O., *disc.*, The future pattern of university education in the United Kingdom, 854
Morton, Alastair, receives R.D.I. diploma, 140-1
Motor cars for The Queen's visit to Italy, *note*, 308
Mott, F., *disc.*, The architect's approach to engineering in tall buildings, 222, 223
Muggleton, Dr. Peter W., *disc.*, Photography in medicine, 693
Müller-Munk, Peter, *memoir* of Walter Dorwin Teague, 232

Munro, William G., *disc.*, Economic developments in Canada, 973
Murgatroyd, Timothy, *disc.*, Architecture in transport, 446
Music on television, The presentation of, *Cantor lecture*, by Lionel Salter, 954
Myth of the phoenix, The, *Dr. Mann juvenile lecture*, by Dr. Maurice Burton, 382

N

Nathan, Lord, *paper*, Geography and the business world to-day, 516 ; *vote of thanks*, Sovereign Nigeria, 539 ; designated chairman of Council, *annual report*, 655 ; *annual general meeting*, 663 ; elected, 639
National poster design award, *note*, 388
Ndu, C. C., *disc.*, Sovereign Nigeria, 538
Neil Matheson McWharrie lecture, Economic developments in Canada, by H. E. the Honble. George A. Drew, 968
Netherthorpe, Lord, *chair*, *Fernhurst lecture*, The nutritional physiology of livestock under natural conditions, 764
New diploma in art and design, *note*, 116
Nicholson, Robert, receives Benjamin Franklin medal from the Duke of Edinburgh, 132
Nizzoli, Marcello, appointed R.D.I., 639
Norman, P. J., *disc.*, Geography and the business world to-day, 524
Norton, Mr., *disc.*, The presentation of science on television, 939
Nugent, Sir Richard, *chair*, Some traffic problems of London, 181
Nutritional physiology of livestock under natural conditions, The, *Fernhurst lecture*, by Dr. K. L. Blaxter, 764

O

OBITUARY :
Beecroft, Walter, 632
Bowes Lyon, Honble. Sir David, 981
Capey, Reco, 731
Chipperfield, Guy, 811
Cochran, Alexander, 477
Crawford, General Sir Kenneth, 394
Cronshaw, Dr. C. J. T., 230
Currie, Sir William, 731
Dalton, Dr. G. C. J., 811
De Forest, Dr. Lee, 732
Desmond, Shaw, 231
Dick, Sir William Reid, 980
Dodds, Jackson, 546
Fearnley, Thomas, 477
Ferguson, Harry, 56
Gagnon, Honble. Onesime, 981
Gribble, Mrs. E. M., 123
Harper, Sir Kenneth, 309
Hutchison, Captain W. M., 231
Innes, John, 900
Jones, Sir Cyril, 901
Krishnan, Sir Kariamanikkam, 732
Lunn, Edward, 981
Maass, Dr. Otto, 811
McGowan, Lord, 810
Marchand, Baron Georges, 733
Maunsell, G. A., 733
Reid, Sir Charles, 394
Saarinen, Eero, 901
Sandilands, G. S., 633
Scott, Professor K. J., 812
Shelley, Sir James, 477
Spurling, Sir Stanley, 309
Teague, Walter Dorwin, 123, 232
Thesiger, Ernest, 309
Vayana, Nunzio, 395
Verulam, Earl of, 57
Vignoles, C. M., 909
Wright, Sir Harold, 395
Yadoff, Dr. Oleg, 478
Oduwole, Bayo, *disc.*, Sovereign Nigeria, 537
Owen, Miss Elizabeth, *disc.*, The work of the Commonwealth societies, 803, 805

P

Page, Sir Frederick Handley, guest of honour at Council dinner, 488
Parker, C. Alan, *disc.*, Bauxite and aluminium with particular reference to the Commonwealth, 897
Paul-Jones, Mrs. Audrey, *disc.*, Wallpaper and its history, 466
Paul-Jones, C. W., *disc.*, Learning to read : an experiment, 178
Payne, Dr. Peter L., *book review*, The Workshop of the world : British economic history from 1820 to 1880, 815
Payne, W. E., *disc.*, The Commonwealth association in theory and practice, 725
Pendrey, A. L., *disc.*, Bauxite and aluminium with particular reference to the Commonwealth, 897
Perry, Norval Roy, *disc.*, The work of the Commonwealth societies, 803
Perry, Rodney, *paper*, The timber industry, 490
Peter Floud memorial prize, *note*, 227
Peter Le Neve Foster lecture, The influence of the Festival of Britain on design to-day, by Sir Gerald Barry, 503
Photography in education, *Cantor lecture*, by Margaret F. Harker, 694
Photography in industry and commerce, *Cantor lecture*, by Michael J. Langford, 665
Photography in medicine, *Cantor lecture*, by C. E. Engel, 680
Pickard, Dr. O. G., *disc.*, The future pattern of university education in the United Kingdom, 853
Pinder, T. H., *disc.*, Welfare and the English school, 577
Piper, David, *book review*, Looking at pictures, 234
Pirie, N. W., *book review*, Nature : earth, plants, animals, 317
Pitman, I. J., *paper*, Learning to read : an experiment, 149
Platts, F. A., *disc.*, The steel industry to-day and to-morrow : a technical review, 594
Pollak, Sylvia, *book reviews*, Decorative art 1960-61, 125 ; Decorative art, 1961-62, 901
Postma, Dr. E. B. J., receives silver medal, 15
Potter, Mrs. Susan, *disc.*, The work of the Commonwealth societies, 805
Presentation of science and the arts on television, The. *Cantor lectures :* I. The presentation of science, by Dr. Tom A. Margerison, 927 ; II. The presentation of the visual arts, by Basil Taylor, 942 ; III. The presentation of music, by Lionel Salter, 954
Preston, Stephen, *disc.*, Some traffic problems of London, 196
Proctor, Sir Dennis, *disc.*, The economic development of the U.K. steel industry, 609

R

Radnor, Earl of, *chair*, The timber industry, 490
Railway modernization conference, *note*, 308
Railways in our time, *Dr. Mann juvenile lecture*, by Cecil J. Allen, 298
Rajan, M. S., *disc.*, The Commonwealth association in theory and practice, 725
R.D.I. : diplomas presented to Stanley Morison, 139 ; Alastair Morton, 140 ; Sir Basil Spence, 141 ; Charles Eames (p.p. Dr. Gleason), 143 ; *oration*, Larger than life, by A. B. Read, 144 ; appointment of Stefan Buzas, Jack Howe and Marcello Nizzoli, 639 ; use of Royal arms on diplomas, 642 ; *annual report*, 645
Read, A. B., *oration*, Larger than life, 144 ; *memoir* of Reco Capey, 731 ; *book review*, Professional practice for designers, 735
Read, Sir Herbert, *book review*, Muntu : an outline of neo-African culture, 547
Read, John, *disc.*, The presentation of the visual arts on television, 952
Reed, W. J., *disc.*, Learning to read : an experiment, 178
Reflection Riding lecture, instituted, 741
Regulation of the number of casts of a sculpture, *note*, 806
Reid, Sir Charles. *obituary*, 394
Reid, Dr. W. Stanford, *address*, Historical factors in the development of Canadian nationalism, 468
Reilly, Paul, *book review*, Pioneers of modern design : from William Morris to Walter Gropius, 237
Rescue from crashed fired aircraft, *Fothergill prize essay*, by V. Cable, 47
Restoration portrait, The, *Fred Cook memorial lecture*, by Oliver Millar, 410

Richardson, Professor F. D., *disc.*, The training of scientists and engineers for industry, 795
Richardson, Garry, *disc.*, Ergonomics : fitting the job to the worker, 276
Richardson, J. Brian, *disc.*, The presentation of science on television, 939 ; *disc.*, The presentation of music on television, 966
Richardson-Jones, J. T., *disc.*, The nutritional physiology of livestock under natural conditions, 779
Roberson, L. H., *disc.*, The future pattern of university education in the United Kingdom, 855
Roberts, E. D., *disc.*, The British contribution to education in Africa, 46
Robinson, Sir Robert, *chair*, The modern chemical industry in Great Britain, lecture II, 353
Royal Commonwealth Society, associated with Society in Tagore centenary celebrations, 322 ; joint meeting with, 798
Royal Drawing Society's exhibition : award of R.S.A. bronze medal to William Hitchcock, *note*, 475
Royal India, Pakistan and Ceylon Society, associated with Society in Tagore centenary celebrations, 322 ; joint meeting with, 798

ROYAL SOCIETY OF ARTS :

Albert medal for 1960 : presentation to Sir Frederick Handley Page, 73 ; for 1961: nominations invited, 243 ; awarded to Professor Walter Gropius, 553 ; *annual report*, 644
Annual general meeting, *announcements*, 487, 555 ; proceedings, 643
Annual reception, arrangements for, 74, 132, 243 ; described, 323 ; *annual report*, 645
Annual report, 644
Archives, Studies in the Society's : XV, 52 ; XVI, 117 ; XVII, 228 ; XVIII, 389 ; XIX, 629 ; XX, 807 ; XXI, 979 ; *see also under* Studies in the Society's Archives
Benjamin Franklin medal for 1960 : presented to Robert Nicholson, 132 ; for 1961 : awarded to Alick Dick, 134 ; *annual report*, 644 ; alteration of terms governing the award, 913
Bicentenary medal for 1960 : presented to J. Cleveland Belle, 143 ; for 1961, awarded to Miss Audrey Withers, 639 ; *annual report*, 644
Birmingham, regional committee formed in, 245 ; meeting in, 557
Bye-laws, proposed amendment of, 556
Chairman of Council, election of Lord Nathan, 639
Christmas card for 1960 : *announcement*, 5 ; *annual report*, 654 ; for 1961: *announcements*, 557, 641, 741, 820
Clock for Council chamber, anonymous present of, 7
Commonwealth film award, *annual report*, 644, 652
Commonwealth section committee, *annual report*, 652
Council, meetings of, 5, 75, 136, 245, 325, 408, 488, 558, 641, 911 ; new Council (1961-2), 663
Council dinners, 74, 488
Examinations, autumn series entries, 7 ; spring series entries, 327 ; whitsun series entries, 489 ; summer series entries, 559 ; *annual report*, 647 ; 1960-61 report, 915
Fellows, new list of, 488 ; number on roll, *annual report*, 654
Film evenings, *announcements*, 4, 73, 133, 242, 909 ; *annual report*, 653
Financial statements for 1960, 560 ; *annual report*, 655 ; *annual general meeting*, 661
'F.R.S.A.' : misuse of designatory letters, 74
Honorary corresponding members : in U.S.A., to be Benjamin Franklin Fellows, 7 ; *annual report*, 646
Income tax relief on annual subscriptions, 407
Industrial art bursaries, 1959 : exhibition on tour, 4, 74 ; 1960 : competition results, 328 ; exhibition, *announcements*, 332, 406 ; exhibition opening, 487, 540 ; exhibition on tour, 742, 820, 911 ; *annual report*, 648 ; 1961 : competition particulars, 640
Industrialization and the countryside (Hampshire basin), survey of, *annual report*, 652
Journal, index and binding-cases, 5, 137 ; extracts from the Journal of 1860-61, 64, 128, 239, 319, 401, 485, 551, 638, 740, 818, 905, 987
Journalism in the Commonwealth, award for, made to Bruce Hutchison, 405 ; *annual report*, 645, 652
Library, *annual report*, 653 ; temporary closure of, 819 ; *see also under* Special meeting
Manchester, dinner in, 74 ; regional committee formed, 245 ; luncheon meeting, 819
Membership, *annual report*, 654
Officers, election of : balloting list, *announcement*, 555 ; ballot, *annual general meeting*, 662-3
Paxton memorial trust bursary, awarded to Peter Glen, 135
R. B. Bennett Commonwealth prize, Dr. Steacie's award accepted by High Commissioner for Canada, 14 ; *annual report*, 644
Reflection Riding lecture, instituted, 741
Regional activities, *annual report*, 646 ; *see also in this list under* Birmingham, Manchester
Secretary's visit to North America, 324 ; *annual report*, 647
Special activities committee, *annual report*, 651
Standing committees, 65, 130
Thomas Gray memorial trust, offer of prize for 1961, 404 ; award of medal for 1960 to Skipper Albert Brown, 404 ; *annual report*, 651
Rundle-Thomas, G., *annual general meeting*, 661-2
Runge, Peter, *paper*, The West Indian sugar industry, 91
Russell, Sir Gordon, *memoir* of Walter Dorwin Teague, 123 ; *disc.*, The influence of the Festival of Britain on design to-day, 515
Russell, Professor R. D., *book reviews*, International interiors and design, Impact of design, 311
Ryder, Captain R. J., receives Thomas Gray memorial trust silver medal, 15

S

Saarinen, Eero, *obituary*, 900
Salter, Lionel, *Cantor lecture*, The presentation of music on television, 954
Salter, Wilfred, *book review*, Symbols, signs and their meaning, 397
Samuels, A., *paper*, Some traffic problems of London, 181 ; awarded silver medal, *annual report*, 658
Sanderson, Ivan C., *chair*, Wallpaper and its history, 450
Sandilands, G. S., *obituary*, 633
Sant, R. E., awarded Fothergill prize for 1961, 910 ; *prize essay*, An automatic door stop, 977
Schofield, J. A., *disc.*, The timber industry, 501
Science on television, The presentation of, *Cantor lecture*, by Dr. Tom A. Margerison, 927
Scott, Professor K. J., *obituary*, 812
Sculpture, regulation of the number of casts of, *note*, 806
Secretary (Dr. K. W. Luckhurst), visit to Canada and U.S.A., 324
Selwyn-Clarke, Sir Selwyn, *disc.*, Human progress and economic growth in the developing countries, 872 ; *disc.*, Economic developments in Canada, 973
Seymer, Nigel, *disc.*, Some traffic problems of London, 198
Shahani, P. K., *disc.*, Learning to read : an experiment, 176 ; *disc.*, Some traffic problems of London, 195 ; *disc.*, Ergonomics : fitting the job to the worker, 275 ; *disc.*, Architecture in transport, 446 ; *disc.*, Welfare and the English school, 577 ; *disc.*, The Commonwealth association in theory and practice, 724 ; *disc.*, Some folklore and history of diamond, 762 ; *disc.*, The nutritional physiology of livestock under natural conditions, 779 ; *disc.*, The future pattern of university education in the United Kingdom, 851
Sharp, Peter E. M., *disc.*, The influence of the Festival of Britain on design to-day, 514
Sheffield, F. C., *disc.*, Ergonomics : fitting the job to the worker, 276
Shelley, Sir James, *obituary*, 477
Sheppard, J., *disc.*, Photography in education, 708
Ship model testing in Britain, *letter* from Dr. F. H. Todd, 124
Shone, Sir Robert, *paper*, The economic development of the U.K. steel industry, 595
Shoobert, Sir Harold, *disc.*, The Commonwealth association in theory and practice, 729 ; *disc.*, The work of the Commonwealth societies, 805
Short, Oswald, *correspondence*, The development of the aeroplane, 395
Silcock, Professor T. H., *disc.*, The Commonwealth association in theory and practice, 725-6 ; *disc.*, Economic developments in Canada, 973
Simmonds, D. G. A., *disc.*, Sport in the Commonwealth, 293

Simons, Elkan, *paper*, Some folklore and history of diamond, 743
Sir George Birdwood memorial lecture, Rabindranath Tagore, by Professor George E. Gordon Catlin, 613
Sir Thomas Holland memorial lecture, The Commonwealth association in theory and practice, by Professor J. D. Bruce Miller, 710
Skidmore, J. S. (Assistant Secretary), *book reviews*, A Victorian publisher : a study of the Bentley papers 315 ; Louis XVI furniture, 480
Small, J., *disc.*, The function of labour and the trade unions in industry and commerce, 263
Smellie, Professor K. B., *chair*, *Sir Thomas Holland memorial lecture*, The Commonwealth association in theory and practice, 710
Smith, H., *disc.*, The function of labour and the trade unions in industry and commerce, 261
Smith, J. M. Vincent, *book review*, Britain's scientific and technological manpower, 310
Society for folk life studies, formation of, *note*, 476
Society of Arts and the Committee of the Privy Council for Trade, *see* Studies in the Society's archives
Soman, S. G., *disc.*, Bauxite and aluminium with particular reference to the Commonwealth, 896-7
Some folklore and history of diamond, *paper*, by Professor S. Tolansky, 743
Some traffic problems of London, *paper*, by A. Samuels, 181
Sovereign Nigeria, *paper*, by Sir John Macpherson, 527
Spence, Sir Basil, receives R.D.I. diploma, 141-2
Sport in the Commonwealth, *paper*, by G. A. McPartlin, 279
Springs of progress, The, *Cantor lecture*, by Dr. James Taylor, 353
Spurling, Sir Stanley, *obituary*, 309
Stamp, Dr. L. Dudley, *disc.*, Geography and the business world to-day, 525 ; *book review*, Atlas of Australian resources, 550
Steel industry to-day and tomorrow : a technical review, *paper*, by Sir Andrew McCance, 579
Steven, Henry, *disc.*, The nutritional physiology of livestock under natural conditions, 781
Stevens, E. C., *vote of thanks*, The Architect's approach to engineering in tall buildings, 226
Stroud, A. H., *disc.*, Architecture in transport, 449
STUDIES IN THE SOCIETY'S ARCHIVES :
XV. A campaign to promote the prosperity of colonial Virginia, pt. ii, by Professor R. L. Hilldrup, 52
XVI. ———, pt. iii, by Professor R. L. Hilldrup, 117
XVII. An address from the Society to King George III : presented 3rd February, 1761, by D. G. C. Allan, 228
XVIII. The Society of Arts and the Committee of the Privy Council for Trade, 1786-1815, pt. (i) by D. G. C. Allan, 389
XIX. ———, pt. (ii), by D. G. C. Allan, 629
XX. ———, pt. (iii), by D. G. C. Allan, 807
XXI. ———, pt. (iv), by D. G. C. Allan, 979
Summerson, Sir John, opens industrial art bursaries exhibition, 487, 540

T

Tagore, Rabindranath : centenary celebrations in Bombay, *note*, 304 ; address by G. W. C. Garrould to Bombay conference, 304-7 ; Society's plans for centenary, 307 ; programme of meetings arranged, 322 ; *Sir George Birdwood memorial lecture*, by Professor George E. Gordon Catlin, 613 ; memorial plaque to, *announcement*, 820 ; *see also* 633
Taylor, Basil, *Cantor lecture*, The presentation of the visual arts on television, 942
Taylor, Captain F. W., *disc.*, Learning to read : an experiment, 176-7
Taylor, Dr. James, *Cantor lectures*, The modern che nical industry in Great Britain : I. Towards a philosophy of the modern chemical industry, 339 ; II. The springs of progress, 353 ; III. The modern chemical industry in Great Britain, 367
Teague, Walter Dorwin, *obituary*, 123, 232
Technical advances in packaging, *paper*, by Dr. V. G. W. Harrison, 821
Television, The presentation of science and the arts on, *Cantor lectures*, 927
Thesiger, Ernest, *obituary*, 309
'This England' : change in a lifetime, *Inaugural address*, by Oswald P. Milne, 8
Thomas Gray memorial lecture, The training of officers for the Merchant Navy, by Captain G. W. Wakeford, 17
Timber industry, The, *paper*, by Rodney Perry, 490
Todd, Dr. F. H., *correspondence*, Ship model testing in Britain, 124
Tolansky, Professor S., *book review*, Matter and anti-matter, 550 ; awarded silver medal, *annual report*, 658 ; *paper*, Some folklore and history of diamond, 743
Toombs, J. A., *disc.*, Technical advances in packaging, 837 ; *disc.*, The presentation of music on television, 964
Toombs, Jennifer, *disc.*, The presentation of music on television, 966
Topham, Brigadier J. V., *disc.*, The coal mining situation to-day, 89
Toseland, Peter, *disc.*, Wallpaper and its history, 467
Towards a philosophy of the modern chemical industry, *Cantor lecture*, by Dr. James Taylor, 339
Training of officers for the Merchant Navy, The, *Thomas Gray memorial lecture*, by Captain G. W. Wakeford, 17
Training of scientists and engineers for industry, The, *Trueman Wood lecture*, by Sir John Cockcroft, 782
Transport, studentship for research into, *note*, 227
Tribe, D. H., *disc.*, Learning to read : an experiment, 179
Tritton, Julian S., judges Howard prize, 910
Trueman Wood lecture, The training of scientists and engineers for industry, by Sir John Cockcroft, 782
Tucker, E. R., *disc.*, The future pattern of university education in the United Kingdom, 855
Tweedsmuir, Lord, *chair*, Economic developments in Canada, 968

U

Underhay, G. F., *disc.*, The modern chemical industry in Great Britain, lecture I, 352 ; lecture III, 379

V

van Ameringen, L., *disc.*, Some folklore and history of diamond, 763
Vayana, Nunzio, *obituary*, 395
Verulam, Earl of, *obituary*, 57
Vignoles, C. M., *vote of thanks*, The coal mining situation to-day, 90 ; *obituary*, 909
Virginia, colonial—*see* Studies in the Society's Archives
Visual arts on television, The presentation of, *Cantor lecture*, by Basil Taylor, 942

W

Wakeford, Captain W. G., *Thomas Gray memorial lecture*, The training of officers for the Merchant Navy, 17
Waley-Cohen, Sir Bernard (Lord Mayor of London), attends annual reception, 323
Wallis, Nevile, *notes*, The age of Charles II, 115 ; Reynolds, Landseer and the Thyssen collection, 386 ; Royal Academy summer exhibition, 544 ; The Edinburgh Festival, 898 ; *book reviews*, Sickert, 314 ; Primitive into painter : the life and letters of John Toole, 814 ; *chair*, The presentation of the visual arts on television, 942
Wallpaper and its history, *paper*, by E. A. Entwisle, 450
Warren, Hugh A., *chair*, Photography in education, 694 ; *disc.*, The training of scientists and engineers for industry, 792
Warrington, G. M., *disc.*, Ergonomics : fitting the job to the worker, 277
Watson, Arthur, judges entries for Commonwealth journalism award, 406
Watson, F. J. B., *book review*, Canaletto and his contemporaries, 234
Waverley gold medal essay competition, *note*, 477
Weatherhead, T. D., *disc.*, Human progress and economic growth in the developing countries, 874
Weilding, C. S., *disc.*, The architect's approach to engineering in tall buildings, 225
Welfare and the English school, *First Edmund Rich memorial lecture*, by W. F. Houghton, 567
Wemyss-Gorman, Commander B., *disc.*, Training of officers for the Merchant Navy, 27

Wernher, Sir Harold, *chair*, *Fred Cook memorial lecture*, The restoration portrait, 410
West Indian sugar industry, The, *paper*, by Peter Runge, 91
West Indies, Commissioner for, *see* Gordon, Garnet H.
White, J. A., *disc.*, Some folklore and history of diamond, 762
Wildgoose, L. W., *disc.*, Wallpaper and its history, 465
Williams, Albert, *disc.*, Economic developments in Canada, 975
Williams, Sir Griffith, *chair*, *First Edmund Rich memorial lecture*, Welfare and the English School, 567
Williams, Professor L. F. Rushbrook, *book review*, Towards universal man, 633
Wilson, John, unable to receive silver medal in person, 15
Withers, Miss Audrey, awarded Bicentenary medal for 1961, 639
Wolstenholme, T. A., *disc.*, The training of scientists and engineers for industry, 793
Woodford, G. P., *disc.*, Architecture in transport, 447
Woodhouse, W. M., *book review*, Tropical houses, 985
Work of the Commonwealth societies, The, *paper*, by Earl De La Warr, 798
Wright, Sir Harold, *obituary*, 395
Wylie, Alan R., *disc.*, Ergonomics : fitting the job to the worker, 276
Wynne, David, sculpture for Taylor Woodrow, *note*, 51

Y

Ya'acob, H. E. Tunku (High Commissioner for Malaya), receives Commonwealth film award, 16
Yadoff, Dr. Oleg, *obituary*, 478
Young, Peter, receives silver medal, 16